MAY 1934 • SMALL HOUSES • THERMAL INSULATION

AMERICAN ARCHITEC

A Preview of Architectural History

The old saying that hindsight is easier than foresight holds true when applied to architecture as well as to anything else. Every architect knows that it is much more difficult to design any sort of building than to criticize the aesthetic composition of the finished structure. So it is also with professional magazines. The mere reporting of architecture's past events holds little interest for the staff of American Architect; and an academic discussion of dead issues has no place between its covers. American Architect prefers foresight. Architectural progress—in all its phases—is the cornerstone of its editorial policy. That policy, throughout the fifty-eight years of the magazine's existence, has fathered many an editorial campaign devoted to the advancement of some important part of architectural practice. That same fundamental policy still holds. The foresight of an editorial policy soundly keyed to current developments of the profession makes the material in each issue of American Architect an informative preview of architectural history » » » » » »

Revival of Business Gets Under Way

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MAY 3, 1934

TO FRANKLIN D. ROOSEVELT,
PRESIDENT OF THE UNITED STATES
THE WHITE HOUSE, WASHINGTON, D. C.

YOU ARE TO BE CONGRATULATED UPON YOUR DECISION TO AUTHORIZE IMMEDIATE ACTION ON A PROGRAM FOR HOME BUILDING AND HOME RENOVATION STOP AMERICAN ARCHITECT HAS LONG ADVOCATED STIMULATION OF THE CONSTRUCTION INDUSTRY AS A MOST IMPORTANT MEANS OF PROMOTING ECONOMIC RECOVERY AND IS WHOLEHEARTEDLY IN FAVOR OF YOUR LATEST STEP TOWARD THIS OBJECTIVE STOP SUCH SOUNDLY FINANCED ACTIVITY IN THE RESIDENTIAL FIELD WILL PROVE EFFECTIVE AS A MEANS OF SPREADING EMPLOYMENT IN MANY BASIC INDUSTRIES AND WILL GIVE PRACTICAL AND MUCH NEEDED SUPPORT TO CAPITAL GOODS INDUSTRIES SO LARGELY REPRESENTED IN THE BUILDING INDUSTRY STOP YOUR PLAN TO MAKE CREDIT AVAILABLE FOR NON-SPECULATIVE BUILDING PROJECTS IS CONSTRUCTIVE AND ENCOURAGING TO EVERY MEMBER OF THE ARCHITECTURAL AND BUILDING PROFESSIONS STOP AMERICAN ARCHITECT WISHES YOU EVERY SUCCESS FOR THE IMMEDIATE DEVELOPMENT OF THIS PLAN AND PLEDGES ITS SUPPORT TOWARD THIS END

BENJAMIN F. BETTS, A.I.A.
EDITOR, AMERICAN ARCHITECT

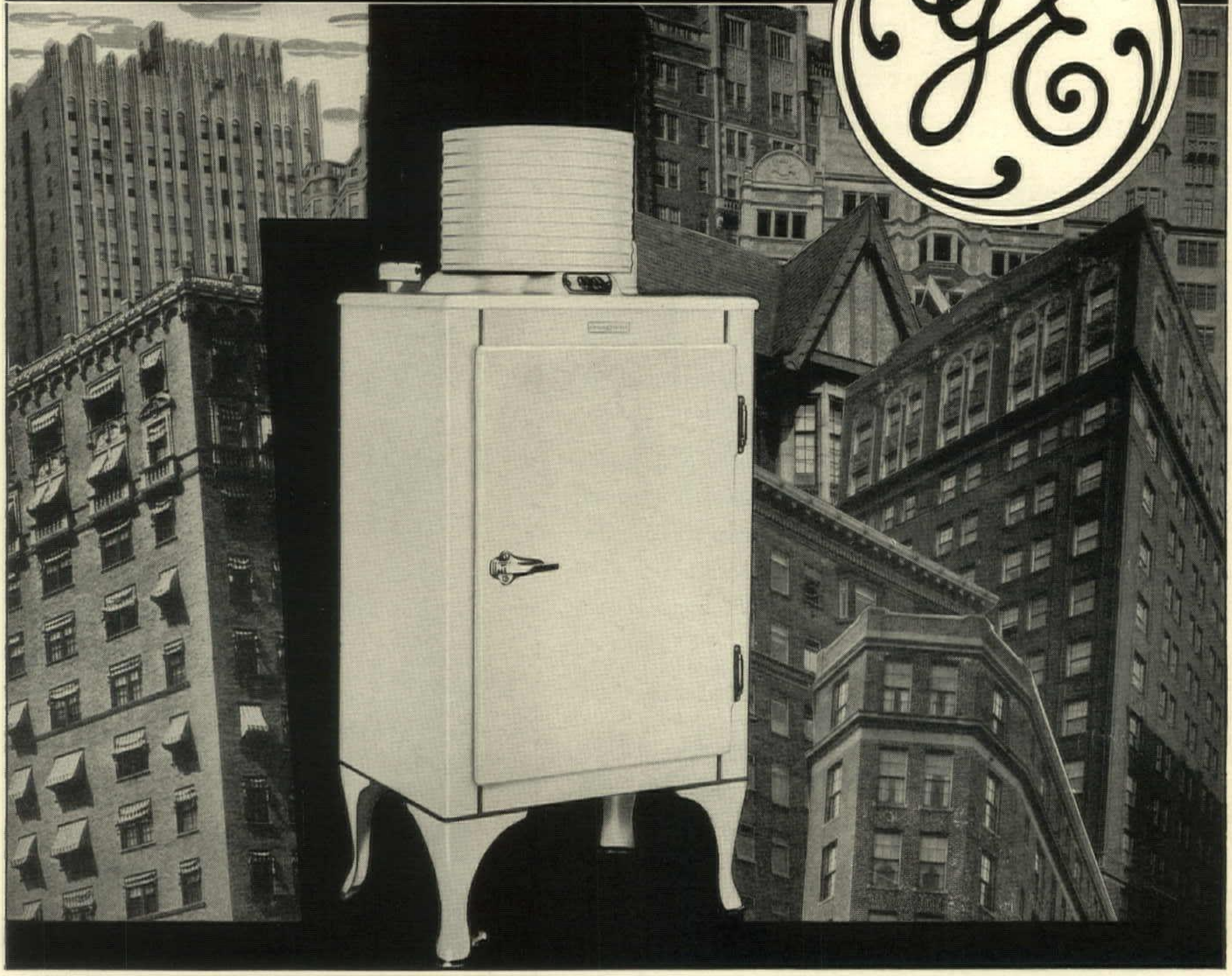
THE telegram reproduced above was sent to President Roosevelt as an acknowledgment that action has started to move the architectural profession and the building industry into their rightful place of economic importance. The National Home Building and Repair Program to which it refers is directly in line with action advocated by American Architect since August, 1933.

"JOBS for Millions Through Revival of Building" in the September, 1933, issue outlined the residential shortage now existing, stressed the need for revision of financing methods, showed that revival of private building was vital to recovery and stated conclusively that public works alone could not vitalize the field of general construction. The article advocated stimulation of private building—both new and modernization work — recognition of the building industry as a basic factor in economic recovery and removal of obstacles to construction activity.

A BRIEF of the arguments and facts covered in "Jobs for Millions" was presented by American Architect on August 29, 1933, to Colonel Louis McHenry Howe for presentation to President Roosevelt. The program was discussed and a copy of the outline left with Charles Elliot II, Executive Officer, National Planning Division of the PWA. A third copy was given to Willard D. Thorpe, Director of Domestic and Foreign Commerce, later in charge of the Real Property Inventory.

ACTIVITIES of the Administration since that time have followed step by step many of the points emphasized. Building needs of the country are being publicized; an inventory to guide an intelligent building program has been started; steps to rectify existing evils in the mortgage situation have been taken; and finally stimulation of actual construction has been broached through the National Home Building and Repair Program. The Administration is to be congratulated, for national recovery through revival of the building industry is now under way.

ONLY 1½¢ PER MONTH FOR SERVICE!



THE first 10,000 General Electric refrigerators installed in Greater New York apartment buildings have been on the job 4½ years. During that time, owners have paid an average of only **1½¢** *per month per refrigerator* for service.

In 1933, 1576 G-E refrigerators replaced other makes in apartment buildings in Greater New York *alone!* Over the entire country this replacement figure is many times greater.

The General Electric Refrigerator's unparalleled record for dependable performance free from costly servicing has made it first choice among architects, builders, building managers and tenants alike. General Electric Co., Electric Refrigeration Dept., Section AA5, Nela Park, Cleveland, O.

GENERAL ELECTRIC

ALL-STEEL REFRIGERATOR

PRESENTING THE NEW OTIS UNDER-COUNTER ELECTRIC DUMB-WAITER

Designed for stores, hotels, restaurants— anywhere that economy of space and installation is desirable.

Otis Elevator Company has designed and built a complete new dumb-waiter. One that is automatic, fool-proof, dependable. One that is practical and economical for almost every two-stop, moderate rise, dumb-waiter installation.

The new Otis electric dumb-waiter is complete in itself — requires no pit; no expensive installation. Has steel hoistway frame which facilitates quick installation. Hoisting machine is of the same quality used in all Otis products.

The new Otis dumb-waiter *conserves space*. As shown in the upper picture, the car, by coming up under the counter, permits the placing of the dumb-waiter at the most convenient point, without sacrifice of space *over* the counter.

Read detailed specifications. Further information available at your local Otis office.

Illustrations show dumb-waiter car loaded with merchandise in the basement and the same car under counter on the first floor.

SPECIFICATIONS

Capacity: **300 lbs. at 50 ft. per minute. Maximum rise 17′ 6″. Two stops and two openings.**

Standard Car Sizes:

3′ 6″ wide by 2′ 2″ deep
2′ 5″ wide by 1′ 6″ deep

Control: **Full automatic. Two types available. One with two buttons at each floor so that car can be called or sent from either floor. The other with single button at each floor.**

Machine: **One-and-a-half-H. P. motor. Ball and roller bearings throughout. Steel worm and worm shaft and bronze worm gear.**

Hoistway Construction: **Steel hoistway frame that completely supports the entire installation.**

Hoistway doors (optional): **At the lower floor, fire-proof bi-parting door. At the upper floor, fire-proof one-piece slide down door.**

Signals (optional): **Speaking tubes and buzzers.**

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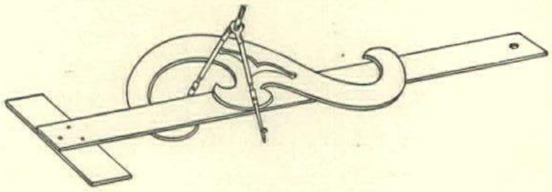


Here's one floor material that never ties your hands

No design is too complex or too intricate for rendering in Armstrong's Linoleum!

In the Illinois Host Building at the "Century of Progress" this fine mosaic floor of Armstrong's Linoleum showed hardly any wear after months of heavy traffic. C. Herrick Hammond, F.A.I.A., Supervising Architect.

A PALETTE of thirty-seven colors in plains, jaspés, and marbelles! *That's* yours to work with in creating distinctive floors of Armstrong's Linoleum!

This versatile floor material not only gives you unlimited freedom in achieving original designs, but offers scores of rich inlaid patterns from which to choose effective floor treatments.

And consider this: Clients appreciate the durability of good linoleum. It wears and wears and never shows it! Millions of Century of Progress visitors tramped across the Armstrong Floor pictured here with no visible effect upon it!

Armstrong Floors are quickly laid for permanent duty. They clean easily . . . save time and money. And their resilience assures comfort and quiet.

Our Bureau of Interior Decoration will gladly help you plan floors and color schemes.

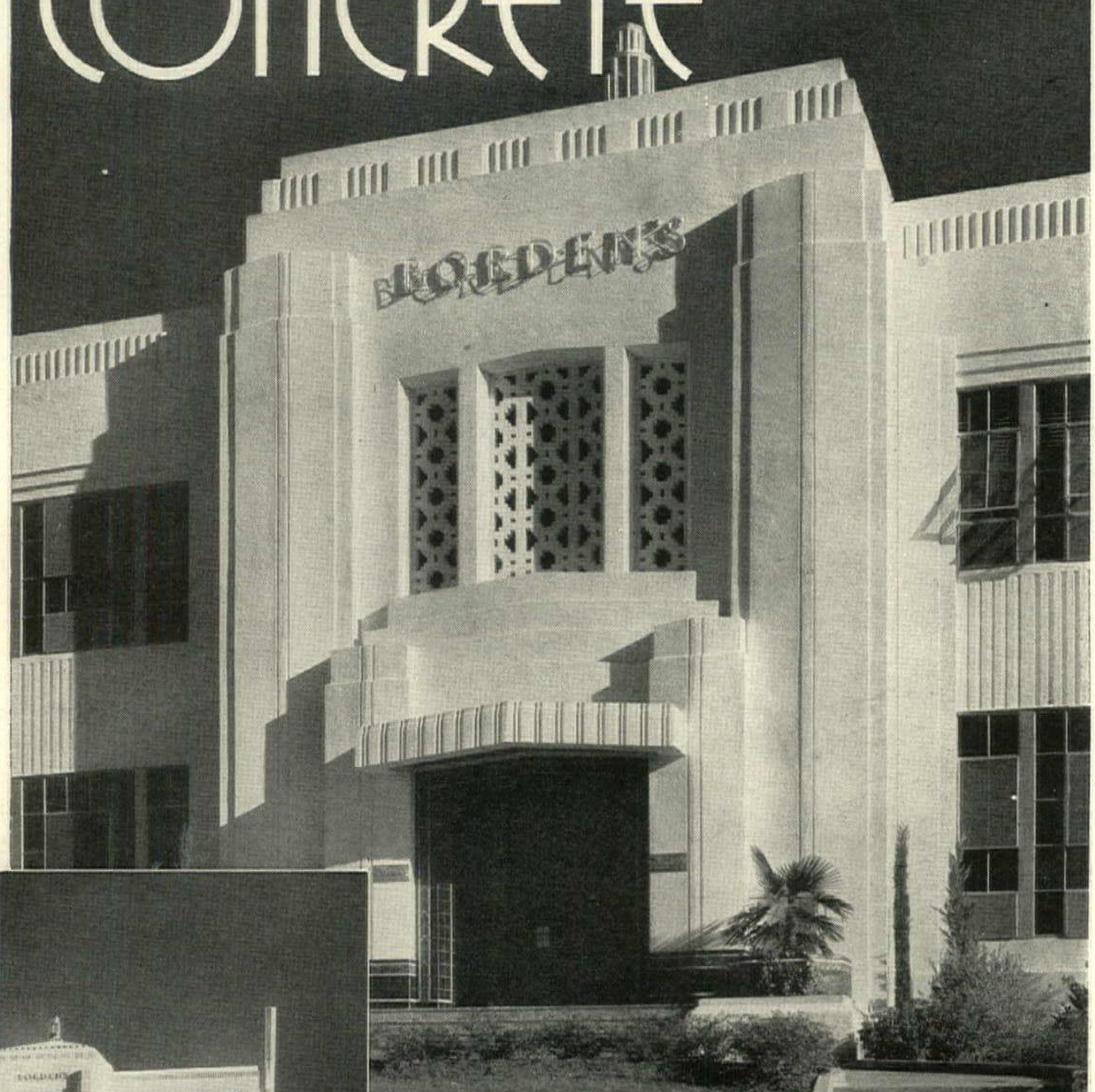
We'll also be glad to send you the names of qualified floor contractors. Armstrong Cork Co., Floor Division, 1201 State Street, Lancaster, Pennsylvania.

See Sweet's Catalogue for colorplates and details.

Armstrong's LINOLEUM FLOORS

LINOTILE ~ CORK TILE ~ ACCOTILE ~ RUBBER TILE

DRESS UP INDUSTRY *with* CONCRETE



The Borden Company's milk products plant at San Antonio, Texas. Architects: Atlee B. and Robert M. Ayers. Contractor: King B. Key.

All exterior ornament cast in place. Surface forms were of plywood with construction joints at designated intervals. Color scheme is mainly a white cement and lime dash coat with ochre color base at the grade line. Entrance steps a bright red.

Concrete was used throughout this milk products plant. Exterior walls are monolithic. Structural frame is reinforced concrete on foundations of concrete piles.

Information on concrete construction will be furnished upon request.

PORTLAND CEMENT ASSOCIATION

Room 265—33 West Grand Avenue, Chicago, Illinois

AMERICAN ARCHITECT

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The Small House

An Obligation and An Opportunity

BY BENJAMIN F. BETTS, A.I.A.

MOST important of all immediate fields of building activity is that of the small house. America needs good small houses; and in satisfying that need architects will find one of their greatest opportunities to better their own condition and to serve the public well.

The design of the small house is no task for a novice. It is one of the most difficult of all architectural problems. Coordination of well-planned space, mechanical equipment and beauty of composition and proportion at a price which the average American can afford to pay constitutes a challenge to even the most experienced and facile designer.

Civic duty and his obligation to society demand that the architect accept the challenge and contribute his best efforts to solving the problem it presents. Only in this way can the character of our communities be preserved and improved. And only through the agency of competent architectural service can the American family obtain the well-designed, honestly-built small house that it wants and to which it is entitled.

Strictly from a selfish point of view the profession *must* capture the small house field. But to do so architects face a problem of revising several well-developed buying habits of a home-owning nation. If the profession will make the public conscious of the needs for expert architectural service, it need have little doubt regarding prosperous activity in the future.

Financial profit in the small house field can result from an individual's technical skill and ability at organization. This has been proved many times.

And there is an extra recompense which cannot be measured in money. What more can any architect ask than a letter like the following, written to her architect by the owner of a small house?

"I am writing to tell you how much Mr. C— and I like the plan of our house. Every day it seems nicer to us. It is exactly what we wanted. We are very glad that we were so fortunate as to have you for the architect. You have so nicely used some of our ideas and added your artistic skill to it all to make a house that we shall always love and be proud of. You have made us very happy, as you have made it possible for us to have just the kind of a house we want."

Architects who have received similar letters know the keen pleasure of working for the most appreciative of all clients—the satisfied owner of a good small house.

The Design of the Small House

BY ROGER H. BULLARD, A.I.A.

WHAT prevents the small house from being well designed is not a matter of cost, for the labor and material is no more costly in the well-planned house than in the poorly designed one. No, it can't be blamed on dollars and cents, but on the manner in which these two items—labor and material—are assembled by the designer. A small house is one of his most difficult problems. It is far more difficult than a large house having the design advantages of length and breadth. The small house is usually on a narrow lot restricted with frontage lines and regulations. Often it is cramped into a poorly proportioned, boxlike form; and its design is damned even before it is started. But conditions of the small suburban lot are fixed. They must be faced; and certainly the architect should be able to produce better results than can be obtained by either the builder or the speculative developer.

A tendency with some designers is to think of a building in two dimensions and draw a workable plan and a well-designed elevation without thinking in terms of perspective or in three dimensions. The trouble with small house design springs from that procedure.

The general shape of the building should be determined first by a carefully conceived roof plan considered in perspective in relation to the length, height and depth of plan to produce satisfying proportions. This, of course, is contrary to the usual procedure. But I am thoroughly convinced that the design of the roof plan should precede the layout of the rooms. If this be done intelligently—with the general location of rooms in mind—plan units will take their places without much modification of the shape of the plan.

The character of design can thus be established at the start, the details and accessories—matters of the designer's individuality—being subordinated to the general shape and proportion of the mass.

Plan and room layout may be good in themselves. Fenestration and elevations may be well studied. But unless the roof plan is well designed in relation to the walls, the whole will lack unity. This system does not apply to the flat-roofed house as much as to the house with a pitched roof.

It is important that the house face the street, if possible, with the main ridge or longer side parallel to the front line. This will give greater depth to a garden in the rear and will use less space on the lot than will be necessary if the house is placed endwise. The longer the house and main ridge can be made, the better the proportion will be in contrast to the barren shape of a box—a thing always difficult to roof, but which results when economy dictates a plan two rooms deep. (See Plan M symmetrical as to the exterior and Plan N for informal arrangement, page 15.)

The maximum length of ridge line may be obtained without increasing the cubage if the house be planned one room deep with light on each side of the main rooms which overlook both front and rear. (See Plan O.) This will give a long, simple roof line with a maximum length of unbroken front wall, making for breadth of treatment and better scale as compared with a front broken by features which tend only to confuse. Other arrangements of this type of plan are shown in Plan P and Plan Q. Note the break on the rear wall, not the front—for greater depth of plan.

Probably the most usual and the most popular plan for the small house is the block plan two rooms deep. This form is compact and the least expensive, because the perimeter enclosing a given floor area becomes less in length as the shape approaches a square. A house with this type of plan requires the least fuel to heat due to minimum wall exposure.

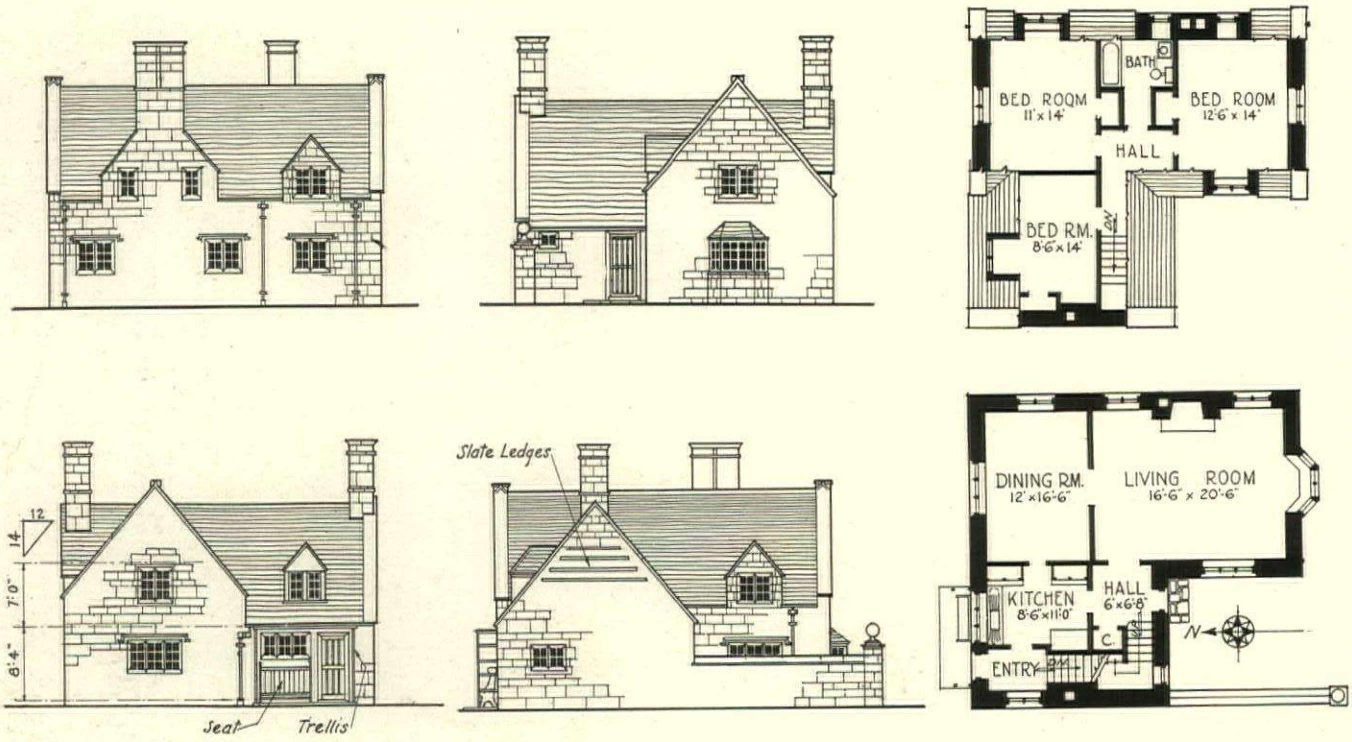
For a full two-story house the hip roof, A, with a fairly low pitch—say 35 degrees—will give best results for the block plan. Height of walls in relation to length of front will make the gambrel, 2A, or gable, 3A, appear proportionately too high due to the extreme span of the roof. This height also allows waste space in the attic. On the other hand, if the eaves line is lowered to a story and a half house—as in 4A and 5A—proportions will be improved and the introduction of dormer windows will give a reasonable second story, although full headroom cannot be gained. (See Side Elevations 4A and 5A.) The cost of adding dormers is offset by the saving in cubage.

It is well either to let the roof dominate, as in 4A or 5A, or to subordinate it to the walls, as in A, and so avoid equality. Considered as a mass, the proportions of 2A and 3A are unpleasant; and if the roof pitch is lowered to the same slope as the hip, the condition will be made even worse. Again, if the eaves line cuts the center of the dormer windows

VAN ANDA

Awarded gold medal, 1934 Better Homes in America Competition

SMALL HOUSE ON ESTATE OF S. A. SALVAGE, GLEN HEAD, N. Y., ROGER H. BULLARD, ARCHITECT



Small House on Estate of S. A. Salvage, Glen Head, N. Y.

to form half dormers, leaders, if used, will be necessary between every dormer. The mansard roof, 6A, is sometimes used with a deep plan of Georgian design where attic space is needed. But with a parapet wall this type of roof is difficult to make watertight. This also applies to 7A, the roof of which has a flat deck and a steeper pitch than A. 8A, though containing a parapet wall, is similar. The roof of 9A combines a steep hip and half dormer windows. A house such as shown in 10A, with the eaves line lowered, gives full dormers.

All of these types may be based on principles of symmetry and can be well adapted to a formal treatment. It is apparent, however, that to accomplish this symmetry sacrifices in the plan are often necessary, which, if carried too far, may make the house less livable than it might be otherwise. Plan 11A shows a small house two rooms deep of informal design.

A long and narrow plan one room deep will give good proportion and two full stories with the hip, B, or gable roof, but is not adapted to a gambrel roof. The ridge line of the hip roof may be made longer to advantage if the end hips are steeper than the front and rear slopes which should be approximately 60 degrees, as shown in B.

An informal plan one room deep is not too binding in principle. The designer can be guided by a sense of balance or composition. For example, a break in the ridge line to give greater headroom in the main portion, 2B, may be supplemented by a lean-to, 3B and 4B, and also—in the long front P and Q—by breaking the eaves line, as at C, 2C, 3C and 4C. The small house, however, is best designed with as few units as possible. Broad surfaces tend to give an appearance of maximum size; gables, dormers and combinations of various materials often produce the opposite result.

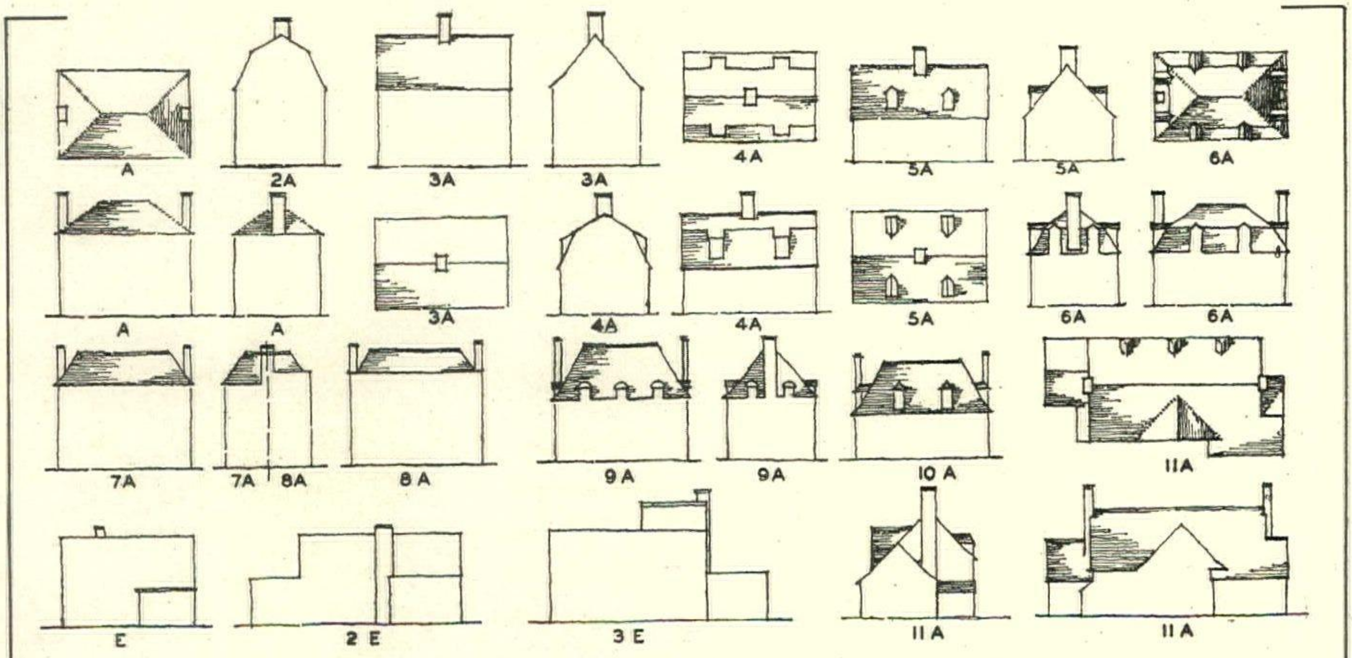
A long, narrow plan gives the desired result more readily than a block plan of two rooms in depth. I prefer the type of design with a long roof line when the lot is of sufficient width to allow it. Since front and rear windows give cross ventilation, the house may even occupy the full width of the lot, allowing for just enough clearance between adjacent properties to prevent a crowded appearance. End windows in this case are usually not necessary.

The L shaped plan offers excellent design possibilities for the small house and is, probably, one of the most popular types. In this type of plan, one arm—preferably that parallel to the street—should be longer and wider than the other so that the main ridge line predominates, as at D, 2D, and 3D. The L may be varied to form two sides of an enclosed garden by introducing a garden wall or hedge on the other two sides. The short arm may extend to the rear—possibly for the garage—and help enclose a rear garden as in 4D. The L shape plan is better adapted for a narrow lot or a corner lot (see plan R), than the long and narrow type of plan.

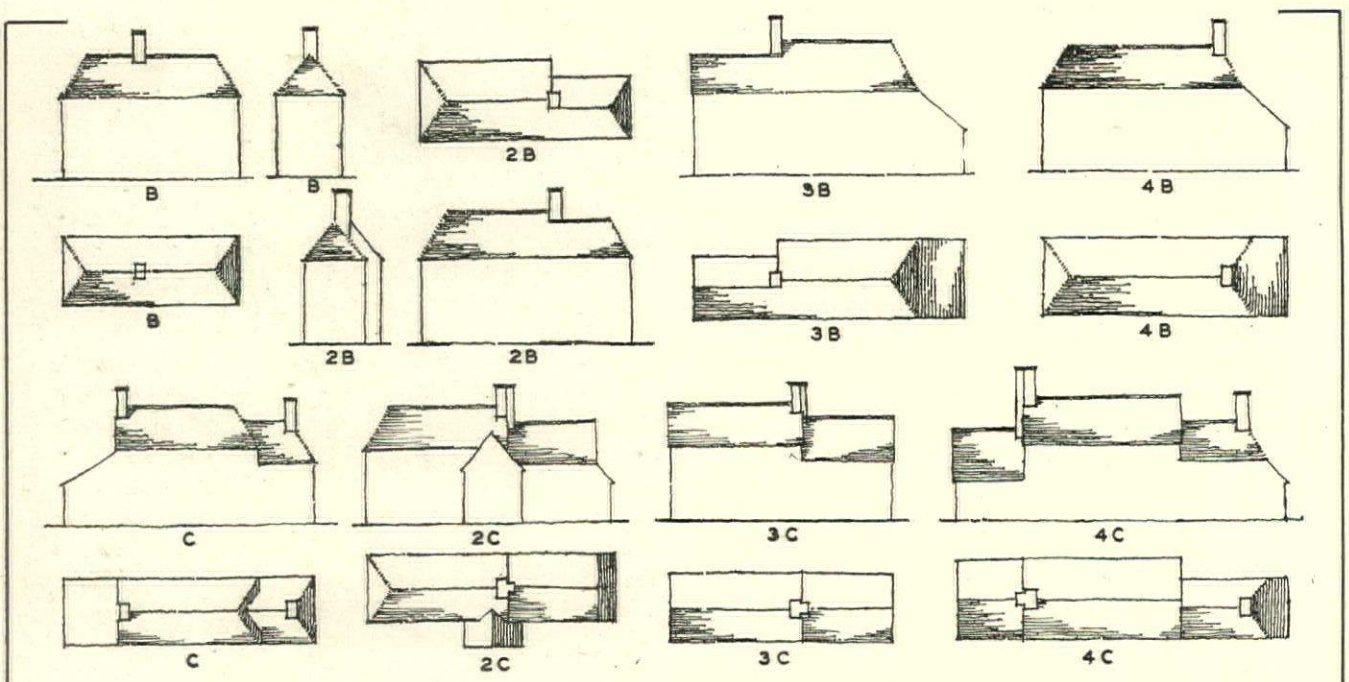
All these types of plan may be adapted to modern design by the use of flat roofs, as in E, 2E, 3E, and

VAN ANDA

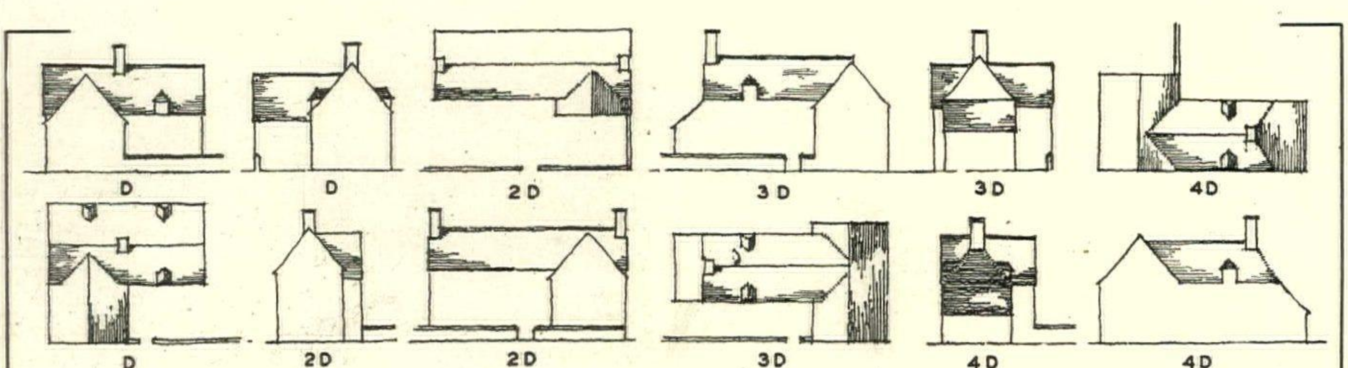
SMALL HOUSE ON ESTATE OF S. A. SALVAGE, GLEN HEAD, N. Y., ROGER H. BULLARD, ARCHITECT



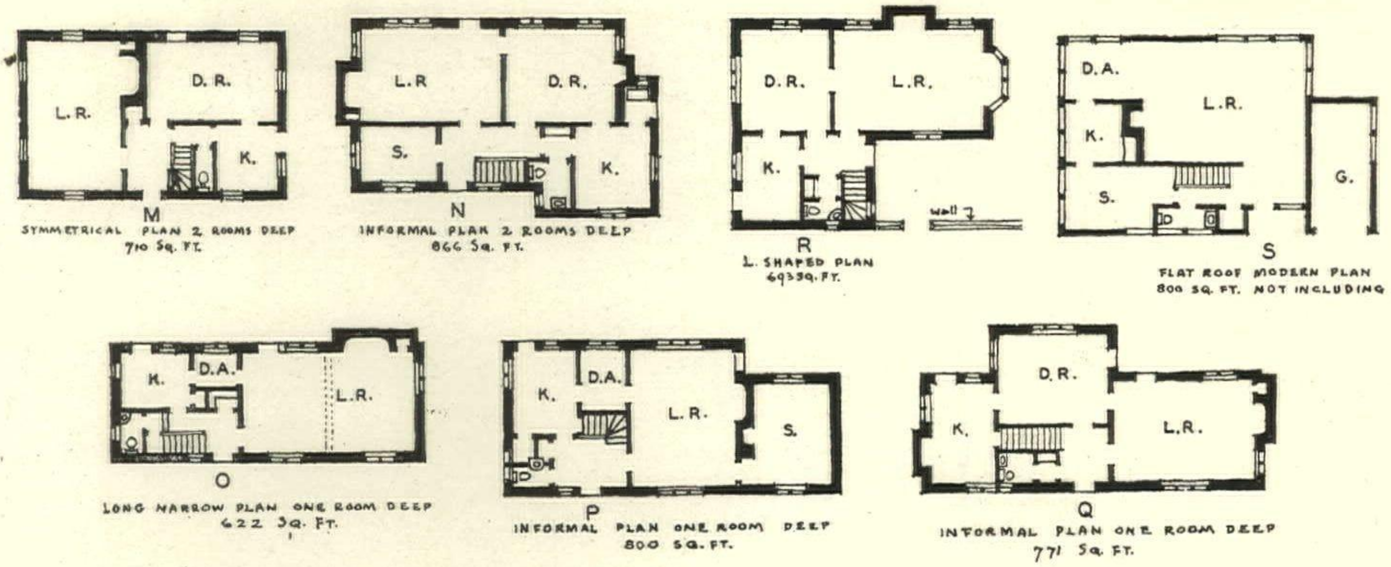
BLOCK PLAN 2 ROOMS DEEP



LONG NARROW PLAN ONE ROOM DEEP



L SHAPED PLAN ONE ROOM DEEP



TYPES OF SMALL HOUSE PLANS

by modifying the fenestration. By itself, however, the flat roof in the small house gives little opportunity for variation, although greater plan depth may be obtained than is possible when the span of a pitched roof would be too great to be practicable. (See Plan S.) Any of these types lead to an unlimited number of possibilities; but I have chosen at random only a few typical examples of small houses that are adaptable in a climate which varies between extremes of heat and cold.

Porches and bays may be introduced as features in any of these schemes, but, in general, I prefer to avoid them so far as possible. Usually they make the small house appear crowded if overdone.

Windows will locate themselves naturally in any arrangement consistent with the type of design; and if the roof is well designed, fenestration need cause little concern. Interest can be added to an informal plan by varying the size and spacing of windows. The extent of variation depends on the size of the room, since bathroom windows, or those in smaller rooms, do not require as large a glass area as those in the more important rooms. Fenestration in the formal plan is often inconsistent in this respect, the same size window being indicated in the bathroom on a symmetrical plan as in the master rooms.

The location of chimneys has an important bearing on the general composition and should be as carefully considered with respect to the roof lines as to individual rooms. In my opinion, no living room should be without a fireplace despite the modern tendency to eliminate it. Among other good reasons for retaining it is that of affording good ventilation.

The shape and size of the lot, character and topography of the grounds and orientation—all these are factors that influence the arrangement and design of the small house. A sloping site will offer opportunities for a difference in floor levels which may be repeated in the roof lines. Such a site may also permit economies by placing the garage at a lower level, or under the main body of the house.

Materials for the exterior walls should be chosen with cost in mind; for where two materials will do the same job, it is far wiser to use the less expensive material and add another foot of space in the house. The combining of two or three materials is a trick usually done to cover up defects in design. It should be avoided, for its tendency is to confuse the design and make the house look smaller. Stone as a facing material is today rarely used in the small house, but in certain localities where native stone is abundant it may be used without being excessive in cost.

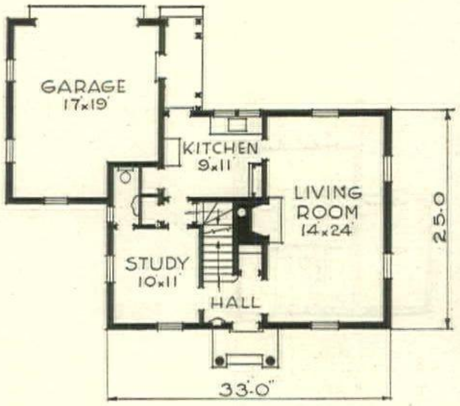
With deep plaster reveals at the windows, wood trim may be avoided. This results in a saving; and by a simple treatment of wood in the form of one or two structural ceiling beams an interesting interior finish may be obtained with little expense.

Brick may be used either as a veneer on studs and sheathing or as a solid wall with furring. Unless the construction is fireproof, I prefer the former because of greater economy and also because it provides better insulation against dampness and cold.

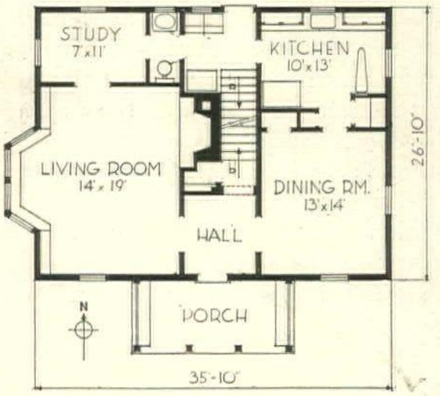
Because the small house is a problem primarily of simple, straightforward design, the use of as few basic materials as possible will prove most successful. In addition to limiting the number of materials on aesthetic grounds, the avoidance of a great number of different trades will make for economy and a lack of confusion on the job.

The relative cost of using pre-fabricated materials in a small house cannot be discussed at this time, for they have not been in use long enough to perfect possible economies. Of those systems which minimize fire hazard and shrinkage resulting from frame construction, there are one or two which, in my opinion, show excellent possibilities. Economy and speed of erection should result from their more extensive use.

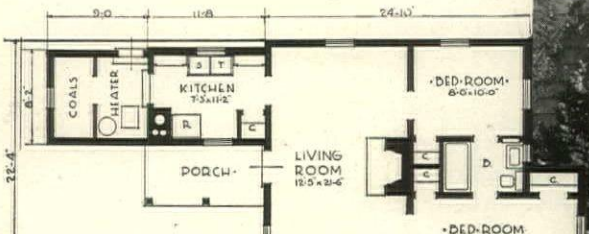
Type 4C, Plan P,
two rooms deep, two stories,
gable roof

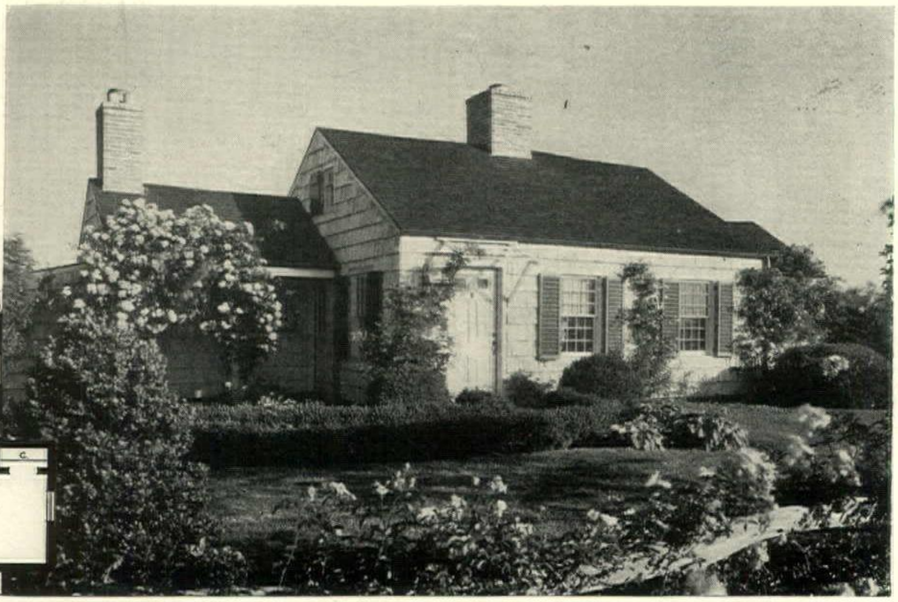


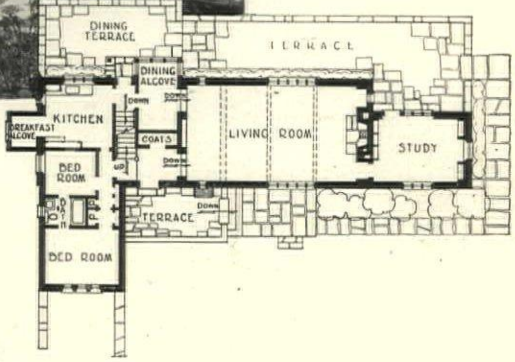
Type 5A, Plan M,
two rooms deep, story and a
half, gable roof with dormers



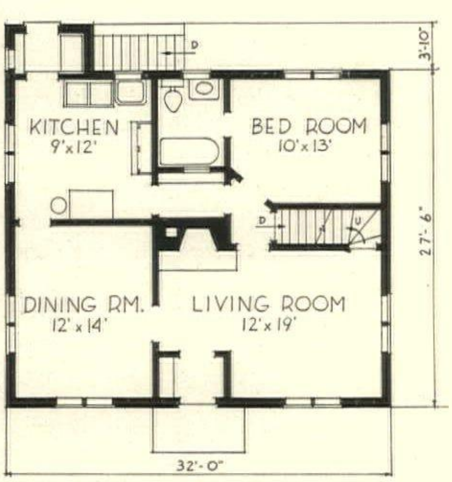
Type 5A, Plan M,
two rooms deep, one story,
gable roof





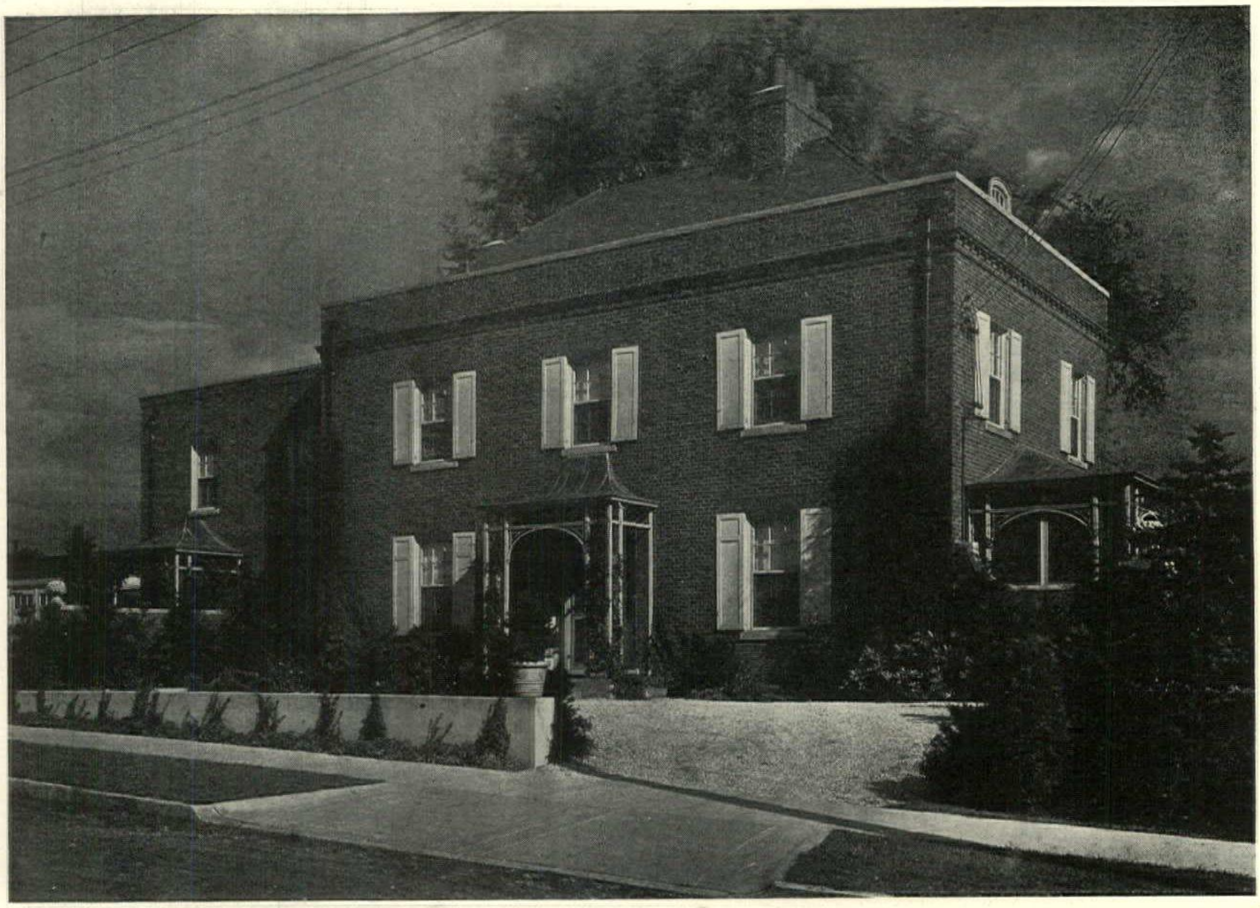


Type 3C, long narrow plan one room deep



Type 5A, Plan M, story and a half, gable roof

EXAMPLES OF SMALL HOUSES BASED UPON TYPES SHOWN ON PAGE 14



Typical example of type 8A, plan two rooms deep shown on page 14

Though general arrangement of the plan and disposition of the rooms will depend on the predetermined roof plan of the small house, a few considerations may be mentioned as having a bearing upon the final design. The most important room in the small house—the living room—should be placed to give a view of the garden on a southerly exposure. For economy it is possible—though not always desirable from the owner's standpoint—to conserve the space necessary for a separate dining room by providing in one large living room a space at one end for the dining table, as in Plan O. This is often more advantageous than two smaller rooms, especially if the dining table can be placed where it does not interfere with the general use of the room.

The fireplace should be placed to give a comfortable arrangement of furniture. The center of the room is not to be preferred, since this location tends to divide the floor area by the grouping of furniture unless a formal arrangement is required.

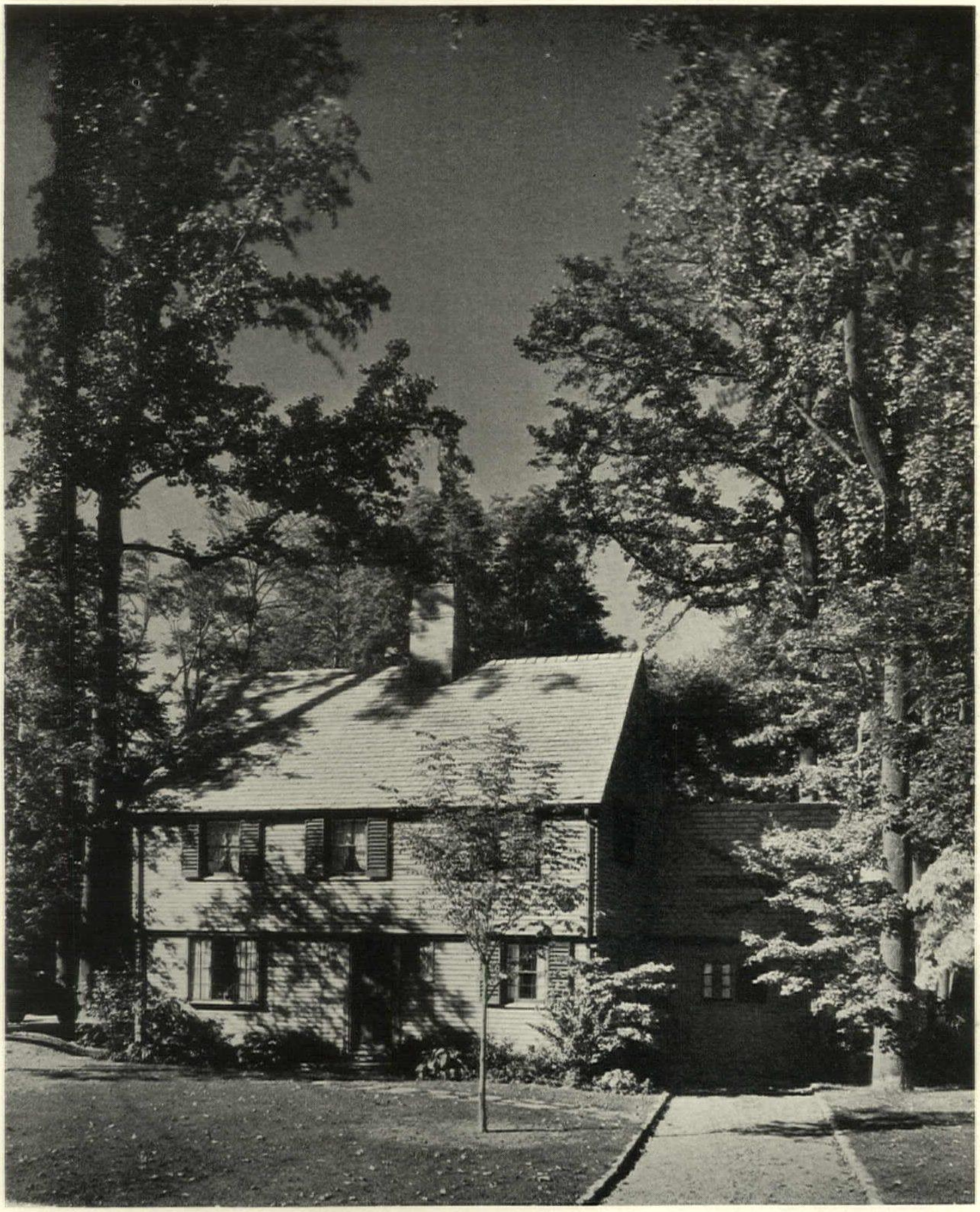
A small entrance hall may be included, arranged, if possible, to give a view to the rear across an intervening room. (See Plans M, N and Q.) This gives a sense of openness and eliminates the feeling of confinement by enclosed walls.

Regarding the arrangement of the kitchen and bedrooms it is sufficient to say they should be carefully considered as to location of working units, closets and wall space for beds and furniture. If the budget allows only one bathroom, it will be well to arrange the toilet separate from the bathroom and possibly provide two lavatories for convenience. Inexpensive shower compartments may now be obtained of waterproofed materials which make them practical in the small house.

Storage space is necessary in every house. Ordinarily, the attic can be used for this purpose, but in the house with a flat roof a special storage room should be included. It is economical to include the garage as part of the house. A two-car garage will cost not much more than space for a single car.

Without considering a specific site, it is quite impossible to lay down any fixed rules governing the design of the small house. Conditions alter cases; and what would apply in one case might not apply in another. But the point I wish to emphasize is the importance of having the small house designed by the architect of experience. How inspiring it is to see the sincere enthusiasm and interest of Sir Raymond Unwin in the small house. This great British architect of international reputation has worked for many years almost entirely with the small house and garden community.

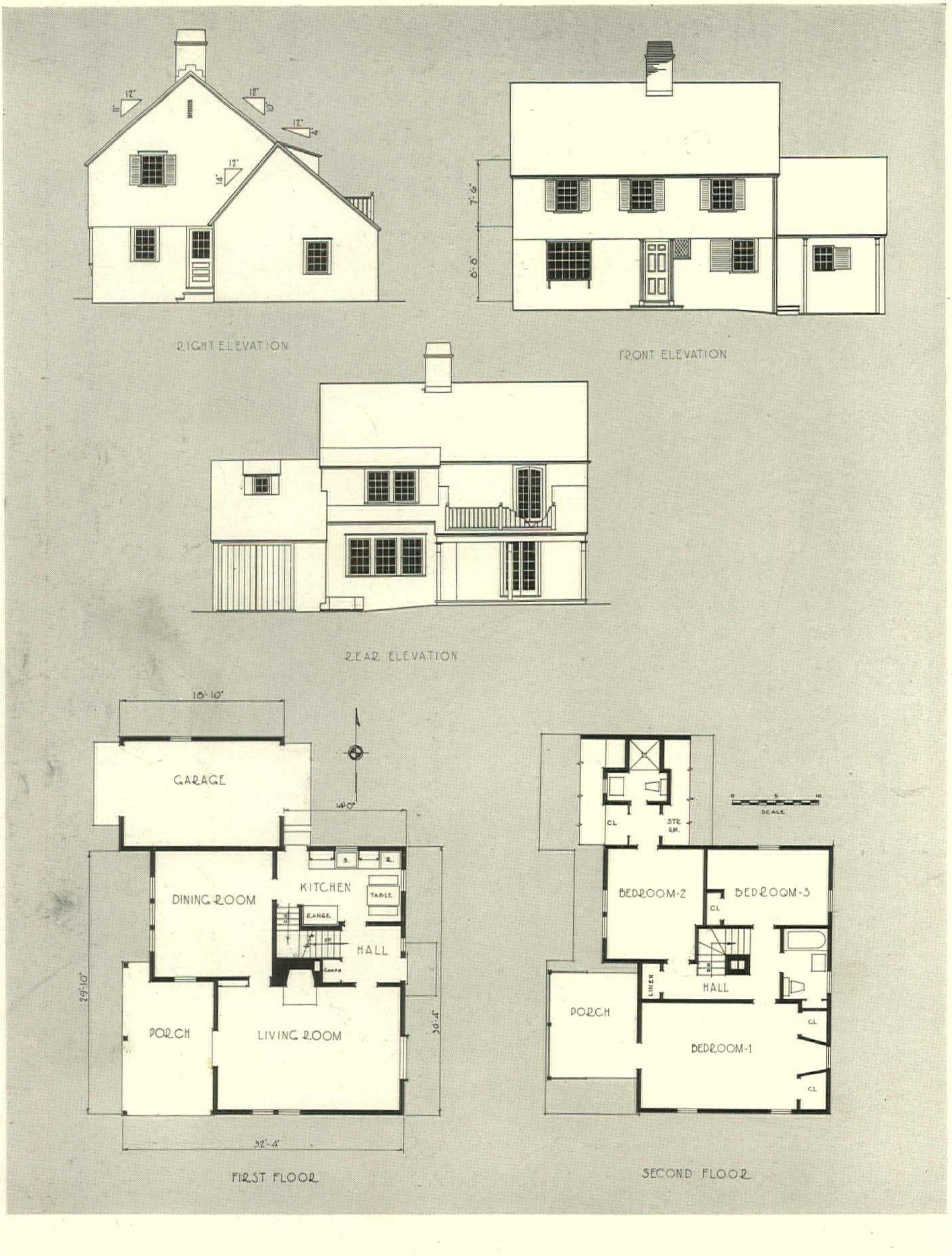
Can we not emulate his accomplishment and put a little more enthusiasm into this field of work which so acutely needs the services of able architects?



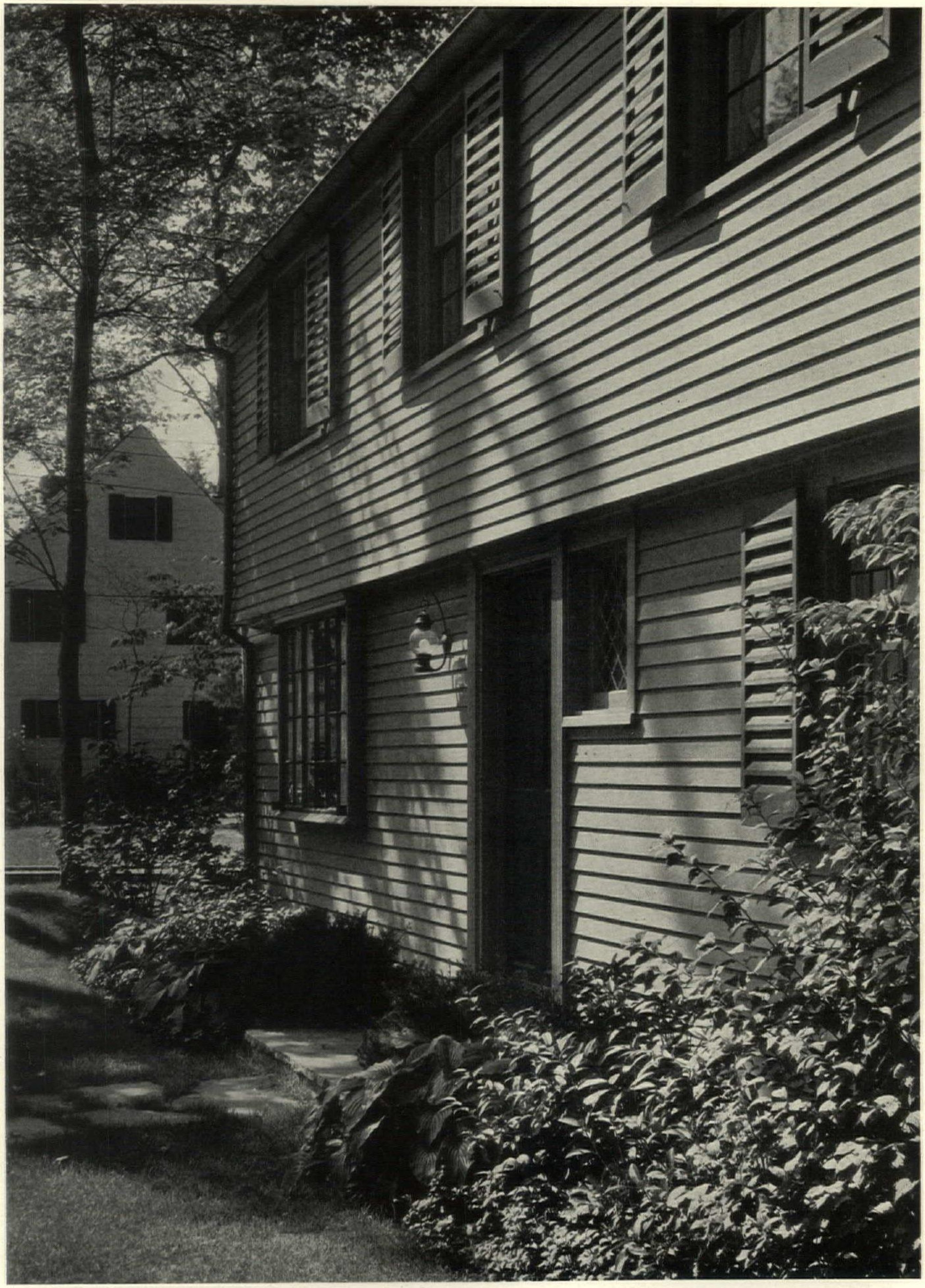
PAUL A. FRANKLIN, ARCHITECT

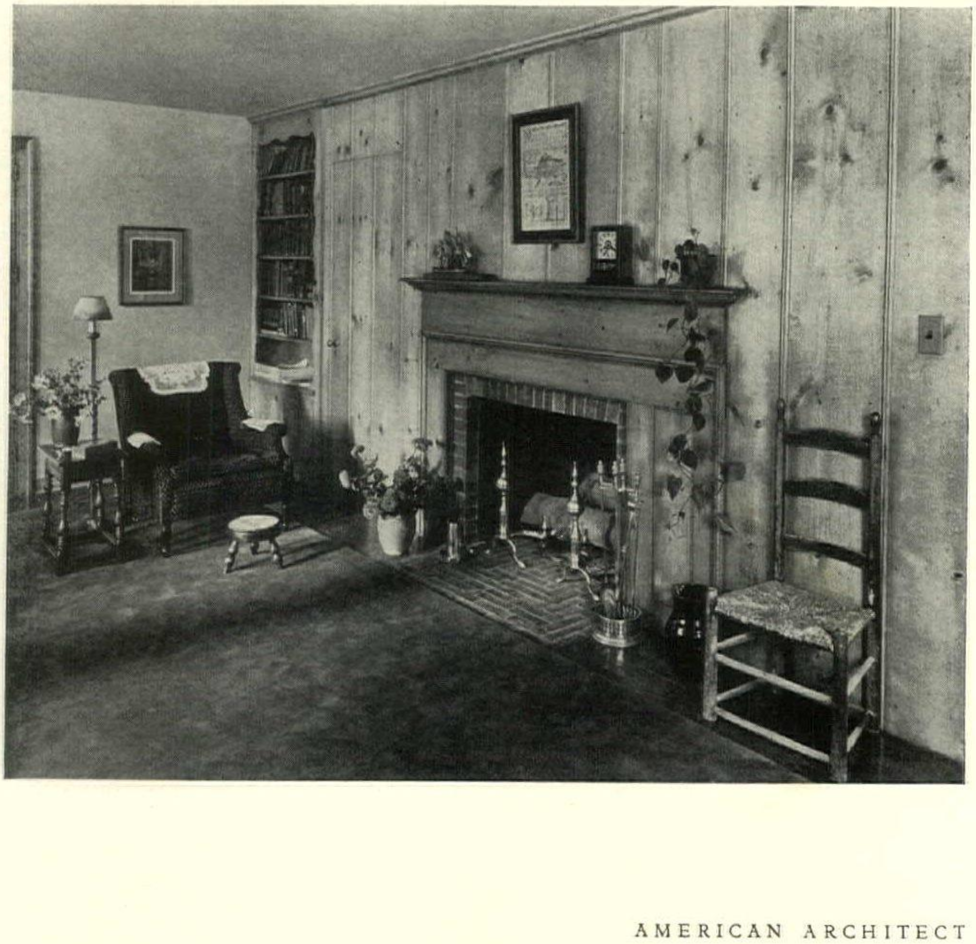
HOUSE OF LESLIE JAYNE, MANHASSET, LONG ISLAND, N. Y.

Photographs by Samuel H. Gottscho



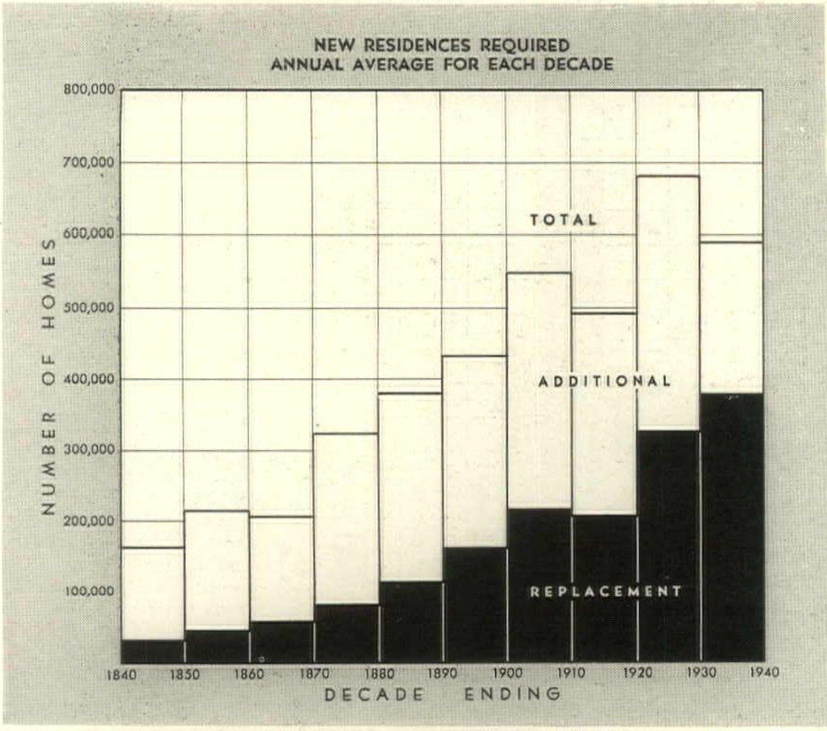
HOUSE OF LESLIE JAYNE, MANHASSET, LONG ISLAND, N. Y., PAUL A. FRANKLIN, ARCHITECT



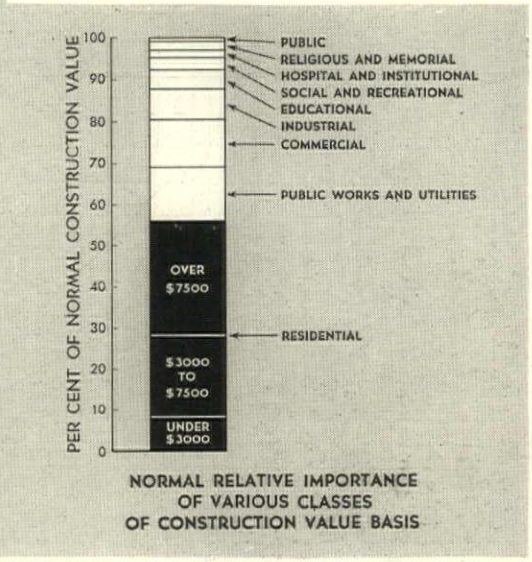


Exterior: Narrow clapboards painted brownish-red. Common brick chimney, unpainted. Dark green shutters. Interior: Rough plaster walls, oak floors. Living room, right, paneled with pine slightly antiqued and coated with dull varnish. House contains 32,000 cubic feet. Cost, in 1932, $11,000

HOUSE OF LESLIE JAYNE
MANHASSET, LONG ISLAND, N. Y.
PAUL A. FRANKLIN, ARCHITECT



On a value basis, normal requirements for small houses outrank those for larger types of construction. The replacement market alone is 64 per cent of the estimated total of residential requirements for the present decade



The Small House Building Market

BY THOMAS N. McNIECE

Market Analyst

A STUDY of the possibilities of recovery in construction leads to the conclusions that revival of the industry will take place first in low and moderate priced residences and that the enormous value involved in this class makes it a worthy field for architectural effort. It seems apparent, moreover, that any architects expecting a quick return to the levels of the "middle twenties" are due for a disappointment. This suggests that many architects may benefit their positions by extending their activities into fields where there is an opportunity for real service. The small house will offer this opportunity to a greater extent than any other class of construction.

Obviously, there is a negligible amount of architectural work involved in public works and utilities as a class. Public buildings comprise but a small proportion of the total; moreover, much of the architectural work in this class seems to be done in State and Federal offices. Thus, these groups which have received much stimulation from public funds have afforded little work for architects.

THE SMALL HOUSE MARKET

It has been repeatedly emphasized that the first important recovery in construction must come in the residential field. Demand for large, expensive houses will lag behind that for smaller houses for the sequence of recovery movements within the industry is dictated by natural law. The first quickening impulse will be felt where the greatest need exists, which now is in the field of smaller structures and specifically in the class of low and moderately priced houses. Within this group the greatest need for replacement exists as well as the greatest demand for new homes arising from an increasing population.

The great numerical preponderance of small homes is, probably, not generally realized. According to the census of 1930, there were approximately 22,855,000 non-farm houses in the United States. Of this number 10,503,000 were owner-occupied, while 12,352,000 were rented. The distribution of these houses in various value and rental groups is shown in Figures 1 and 2. The preponderance of

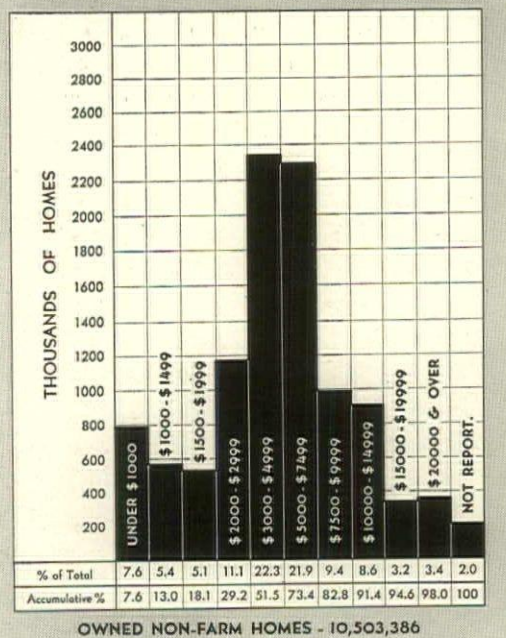


FIGURE 1

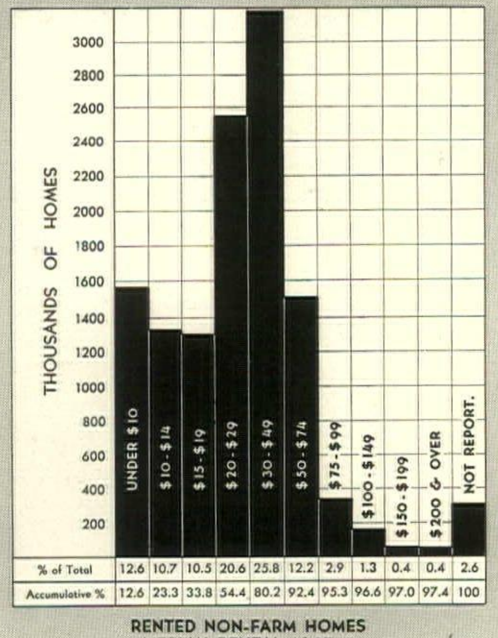


FIGURE 2

In Figure 3 . . .

Fluctuations in rate of population increase produce corresponding irregularity in number of houses required and contribute to peaks and valleys in the trend of general building. Replacement needs, being cumulative, show a more uniform yearly trend

In Figure 4 . . .

House building dominates the industry and can be measured by trends of total construction; "b" shows probable recovery rate to normal, adjusted to slower growth of population. Need for long deferred construction may produce a more rapid rate of recovery

houses in the intermediate price range is strikingly illustrated in these charts. And it is obvious that over 44 per cent of owner-occupied, non-farm houses are included within the value of $3,000 to $7,500. It is also apparent that 73.4 per cent of all owner occupied non-farm houses are valued at less than $7,500. In other words, if architects' services were restricted to homes of a value of $7,500 or more, they would be limited to about 27 per cent of owners' houses.

Data are not available from which an accurate estimate can be made on the relative value of these groups. It is probable, however, that houses with a value of $7,500 and more may account for approximately 50 per cent of the total value.

Industrial building and public works and utilities comprise about 22 per cent of the normal construction program. Of the remaining 78 per cent, about 55 per cent may be assumed to be residential and 23 per cent composed of commercial, educational, social and recreational, hospital and institutional, religious and memorial and public building.

Consideration of these data suggests that the best opportunity the architect has for extending his services is by capturing a greater share of the residential class. Again remembering that we lack the data to make an estimate of known accuracy, it seems probable that residential construction between the limits of $3,000 and $7,500 may include about 35 per cent of all residential building or 20 per cent of total construction. Based on estimated normal requirements, this is probably over 1.3 billion dollars per year. This is too large a percentage of the market to surrender without an effort at profitable capture.

NORMAL AND ACTUAL BUILDING

The real significance of the term "estimated normal requirements" should be explained. The actual need for building is determined by the population of the country. All new construction falls into one of two classes, additional and replacement. The rate at which the need develops for additional construction is determined primarily by the rate at which the population increases and secondarily by the development of new industries. The latter is usually of low relative importance compared with the total demand. Major wars and serious depressions always cause great distortions in the rate at which people are added to the population. This is manifested by changes in immigration, emigration and birth rate.

The erratic changes from decade to decade in the number of people added to the population of the country are indicated in Fig. 3. These changes must sooner or later cause erratic variations in the amount of additional construction necessary to provide for homes and business activities.

Replacement demand is but slowly affected by these quick changes in rate of growth and is chiefly dependent on the total population and the characteristic useful life of the structure. The uniform trend of replacement requirement is, therefore, typified by the graph of total population also shown in Fig. 3.

When building demand seriously exceeds supply it tends to develop speculative activity which frequently runs away with itself. This in turn develops surging demands on credit, the condition of which alternately stimulates and retards construction. Thus, to the physical variations in activity imposed

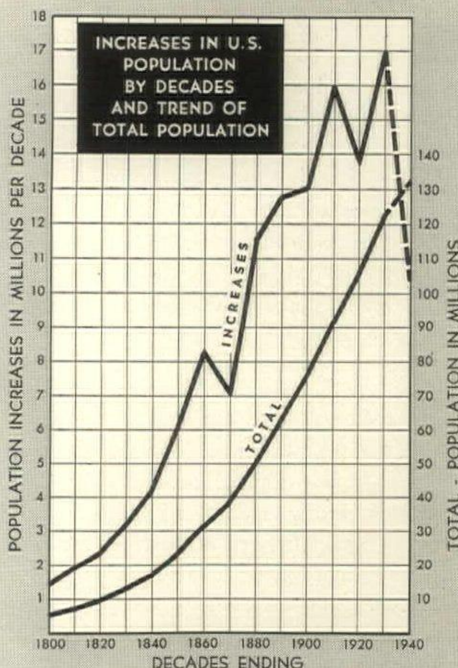


FIGURE 3

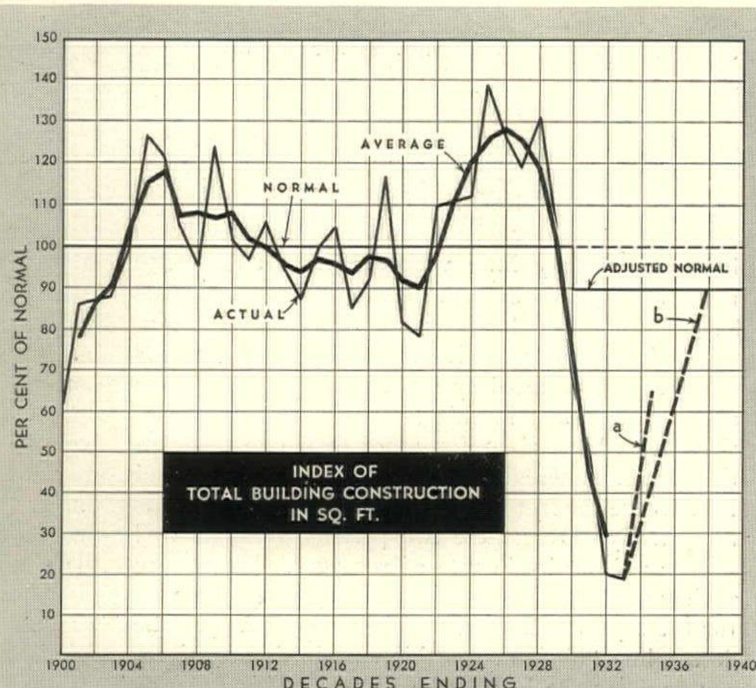


FIGURE 4

by changes in rate of growth in population are added those due to faulty balance between supply and demand, changing credit conditions and business cycles. These may occasionally tend to offset each other in part, but usually become additive in effect, resulting, therefore, in wide variations in the industry.

The erratic course of building construction resulting from all these variables is shown in Fig. 4. While this includes total construction, it may be accepted as a good measure of residential building activity. This is primarily because residential building is so important that it governs the course of the whole industry. In this case, the index measures square feet of building construction in contracts awarded. The normal line, marked 100, is dependent in the last analysis on the trend of total population shown in Fig. 3, although any increasing demand per capita for building is provided for in the normal. Both the actual and a three-year moving average of the actual figures are shown in order to make the nature of the fluctuations clear. The normal is based on the period between 1900 and 1926. The rising trend shown in the total population curve is eliminated in the normal line shown in Fig. 4, which at each point shows the normal level for building based on the population at that time.

No architect should assume the level of activity during 1922 to 1929 as normal. Unfortunately, as far as the present decade is concerned, the reduction of this peak to normal levels or to 100 as shown in Fig. 4 will still represent an average level for the decade between 1930 and 1940 that will be too high. This is because the increase in population for the present decade will be only about 60 per cent of that attained in the prior decade. This is indicated in Fig. 3 in which the increase for the current decade is estimated at slightly over 10 million which will bring the estimated total population to about 133 million by 1940. The population increased by 17,000,000 in the decade from 1920 to 1930. Thus, it is estimated that the increase for the present decade will be about 7,000,000 less than for the prior one.

This means that the reduced growth of population in the present decade will require 1,450,000 fewer homes in this decade for additional population. This is the net effect of decreased immigration, marriages and birth rate and increased emigration. For this reason, but 600 men will be needed to produce housing for additional population for each 1000 men that were required in the prior decade. The net effect of this reduction in the additional population will, it is estimated, reduce the normal construction level for the decade to about 90 per cent of the prior normal. This is indicated graphically in Fig. 4.

It will be noted that actual construction levels since 1929 have been far below this level. In this interval, surplus residential facilities have been converted into a shortage especially in the low and moderate price class. Even so, a study of conditions does not indicate an immediate return to the reduced normal level.

In Fig. 4 are shown two dotted lines marked "a" and "b" rising from the 1933 level. These are shown to illustrate recovery rates that are characteristic of the industry. Every industry shows certain typical rates of fluctuations. For example, the massive construction industry characteristically shows slower increases and decreases than the more nimble textile and automobile industries. If the graph showing actual building activity in Fig. 4 be examined, it will show that the industry has shown a remarkable degree of uniformity in maximum rates of recovery for one-year intervals.

Beginning with 1900 and extending to 1925 there are 5 one-year periods of rapid recovery. These have shown very little variation from an average rate of 28 points a year. There is no case in the long period covered where this rate has been maintained for two consecutive years. This rapid rate is graphically illustrated by the dotted line "a". There are two instances in this interval where construction levels have risen for more than two consecutive years. These began with the years 1900 and 1921 where the increases continued for 5 and 4 years respectively. Over these two periods we again find a close uniformity in rate of recovery. These were at the average rates of 13.2 and 15.5 points per year for the 5 year and 4 year periods respectively. The dotted line "b" indicates this sustained rate of recovery from the low levels of 1933. This suggests a return to the adjusted normal level between 1937 and 1938. The short, sharp fluctuations, especially in view of the deferment of construction, may carry the volume above this level somewhat sooner, but it seems improbable that the industry as a whole will recover its lost ground much before this time.

There are two points to be derived from this analysis. First, the super-normal levels of 1923 to 1929 should not be expected to begin for another 7 or 8 years. Second, recovery to the reduced normal levels indicated will not be attained immediately. This enforced delay in the return to prosperous activity emphasizes the desirability of thoughtful effort to broaden the market for the architects' services.

SHORTAGE IN RESIDENTIAL BUILDING

The estimated value of 1.3 billion dollars for normal annual residential construction within the limits of $3,000 to $7,500 is based on the estimated value of all residential construction adjusted to the reduced normal shown in Fig. 4 for the decade between 1930 and 1940. The curtailment in residential building which has been declining for virtually six years has resulted in a real shortage of homes based on any reasonable standard of living. Due to lack of comprehensive data, this shortage is difficult to measure accurately.

The Federal Reserve Board publishes an index of residential building. For the five years from 1924 to 1928 inclusive, this index indicates an average annual activity of 116.6 per cent based on the 1923 to 1925 level as 100 per cent. For the five years from 1929 to 1933, inclusive, this construction declined to an average for the period of 39.6 per cent or an average annual shortage of 60.4 per cent. Application of these factors to estimated annual needs for the two periods named indicates that the surplus of the former period was overcome in 1931 and converted to a deficit of approximately 1,221,000 homes by the end of 1933.

This estimate allows for the reduced growth of population during this decade. It must be considered only as an estimate based on trends and not on any record of number of homes actually constructed.

Another method of estimating the shortage is to consider the housing necessary for additional population and for replacements and to deduct therefrom the estimated number of houses constructed in the same interval. From a consideration of various building data, it seems probable that the surplus housing created during the peak prior to 1929 disappeared during 1931. Since the middle of 1931, population has increased about 2,300,000. This would require about 480,000 homes. Replacement during this interval would, no doubt, amount to approximately 381,000 homes annually or 952,000 for the period. This figure is estimated as normal replacement based on a country-wide average life of 50 years for residences. The sum of these two is 1,432,000 houses from which should be subtracted 200,000 houses estimated to have been built in the last 2½ years. This leaves 1,232,000 homes as compared with the prior estimate of 1,221,000 as a possible shortage.

The actual shortage may be more or less than these figures. There are no data available from which this can be determined with known accuracy. Various estimates of this shortage that have been made extend from 800,000 to 1,500,000 homes. All of those estimates include a large amount of deferred replacement as part of the shortage. The most pressing and immediate need will be for additional housing for increased population.

If the shortage be assumed as 1,200,000 homes about 530,000 of these may be expected to be within the value limits of $3,000 to $7,500. Various surveys made show that the first revival of residential construction will be preponderantly in this class.

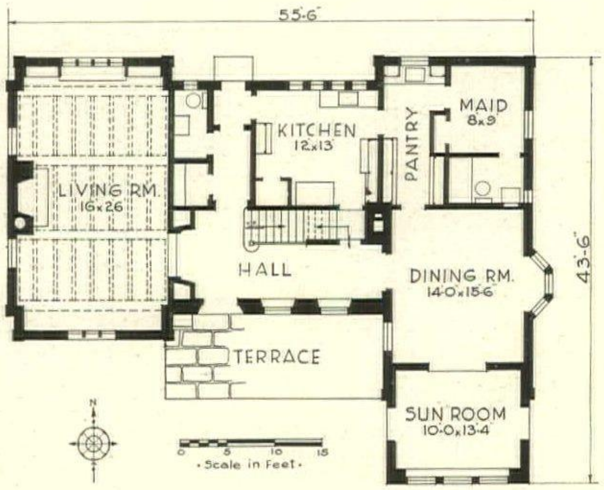
Small houses, therefore, will offer the first opportunity for relief from present difficult conditions. This same sequence of recovery has already been manifested in the motor industry wherein the first resurgence of demand has been for cars in the low and moderate price class. Approximately 85 per cent of all cars sold have a wholesale value of less than $750 each. The low and moderate priced automobiles have been the profitable backbone of the industry.

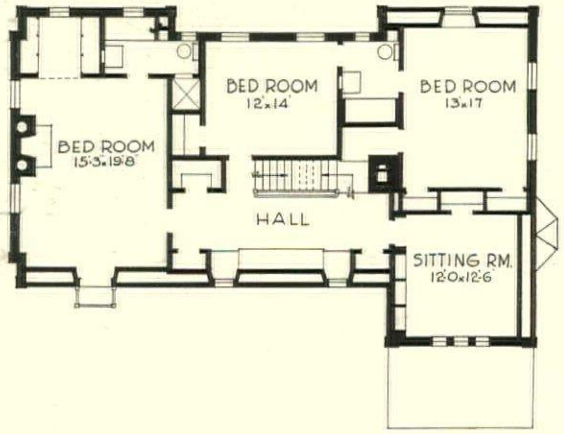
For the architect there is probably no greater opportunity in the country for effective increase in economic activity than in providing better houses for the average family. This means improved construction, better utility and greater beauty at lower cost. All these must be attainable in the same structure. The attractive appearance of the small car has not detracted from its utility, nor has it increased the cost. What the engineer has done for the small car of today, the architect can do for the small house of tomorrow.

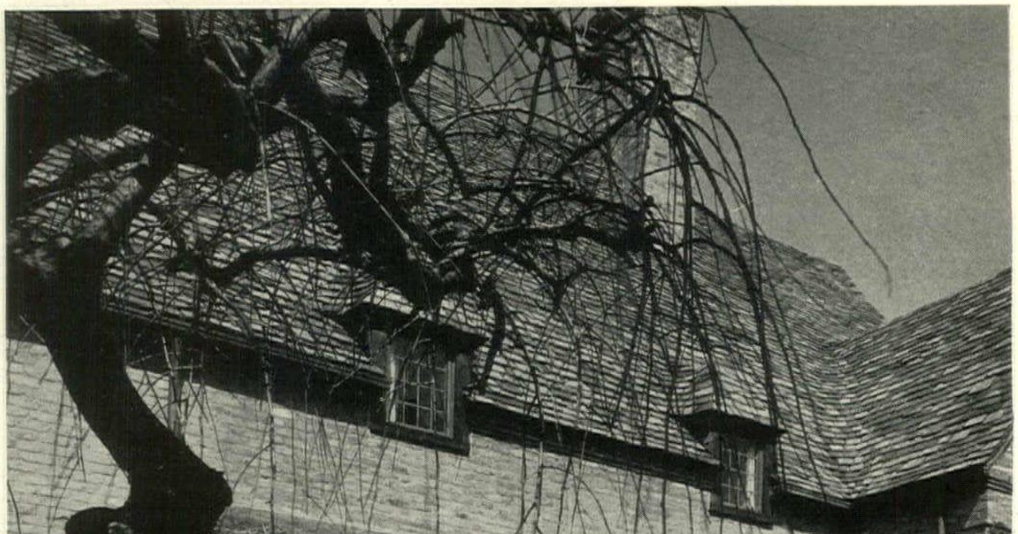
FRANK J. FORSTER AND
R. A. GALLIMORE, ARCHITECTS

HOUSE OF ARTHUR C. EBINGER, BROOKLYN, N. Y.

Photographs by Robert MacLean Glasgow

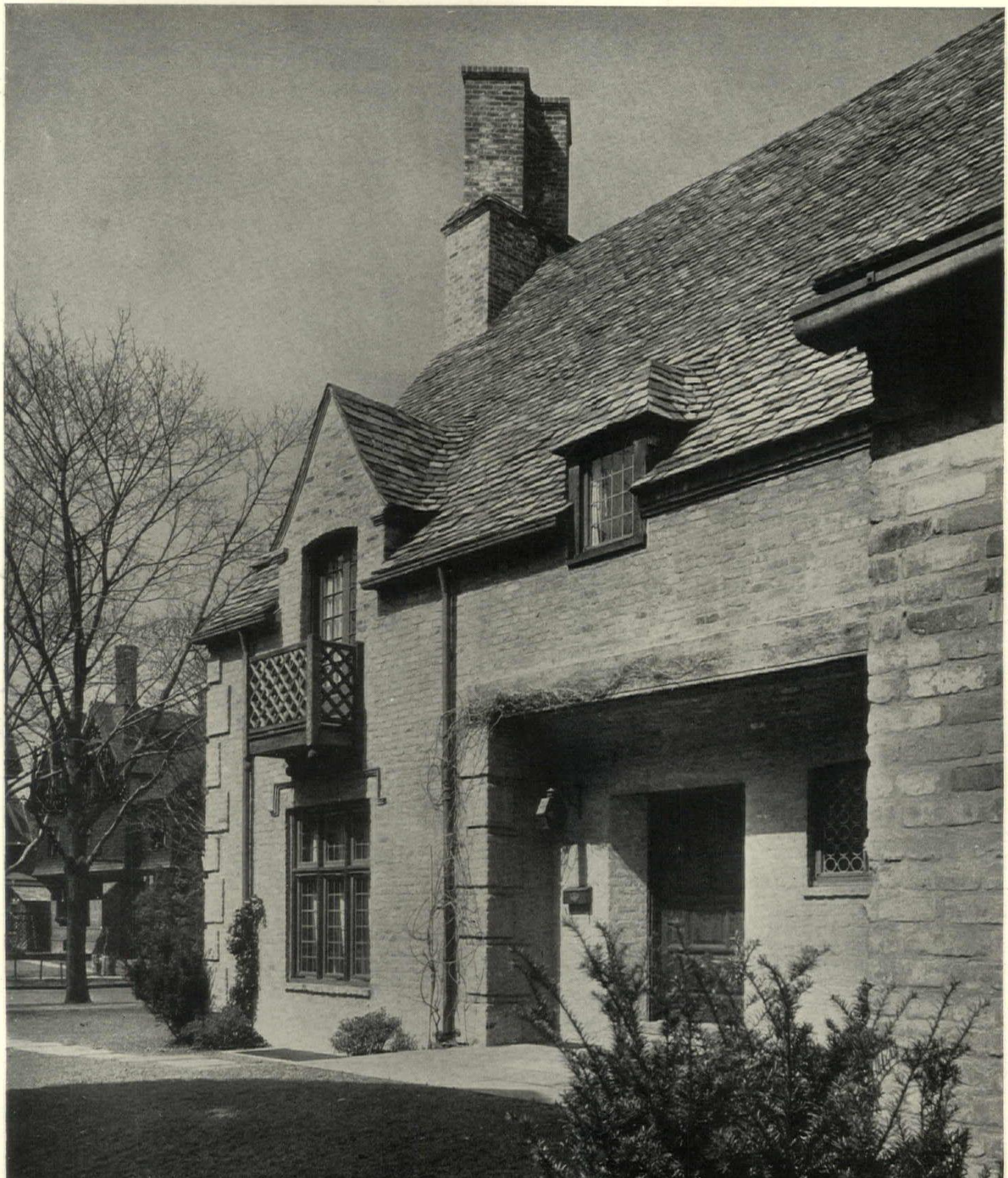


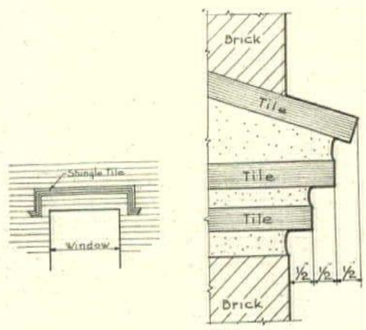




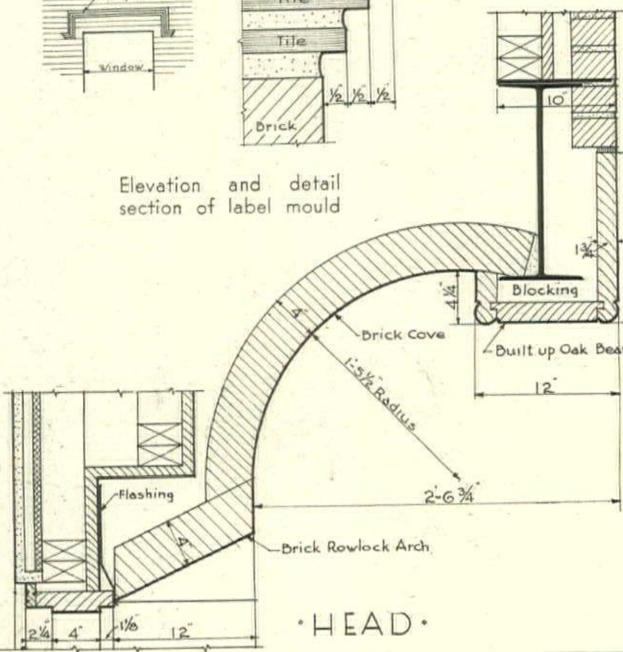
HOUSE OF
ARTHUR C. EBINGER,
BROOKLYN, N. Y.

FRANK J. FORSTER,
AND R. A. GALLIMORE,
ARCHITECTS

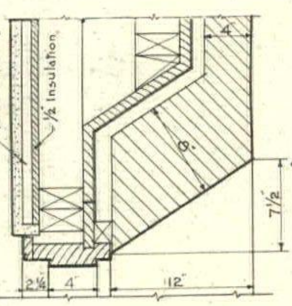




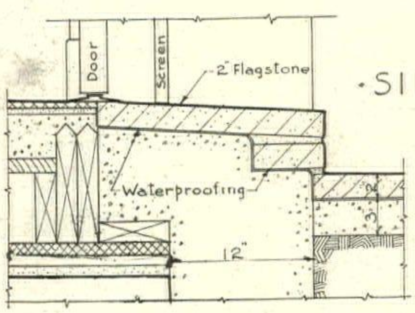
Elevation and detail section of label mould



·HEAD·

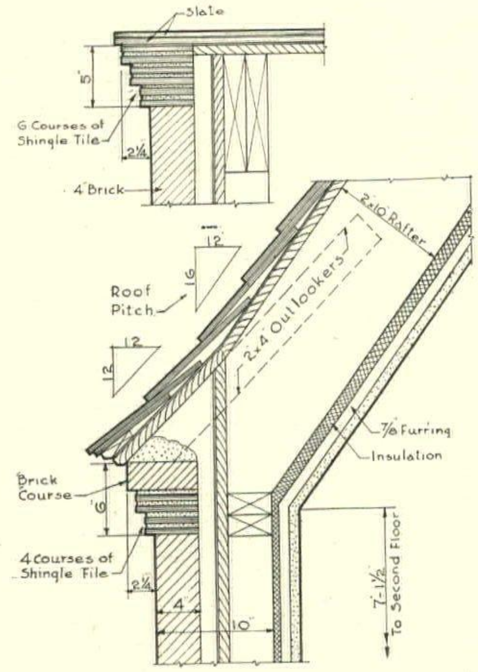


·JAMB·

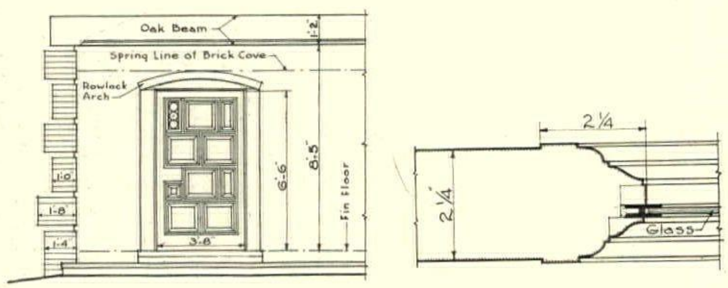


·SILL·

Entrance detail



Typical cornice and rake



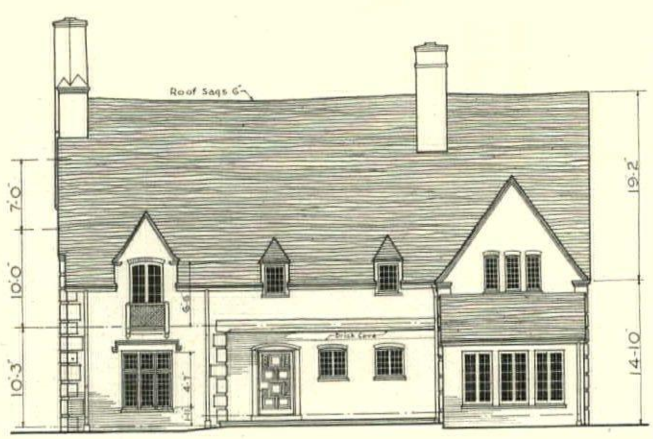
Entrance elevation and detail of door

HOUSE OF ARTHUR C. EBINGER

BROOKLYN, N. Y.

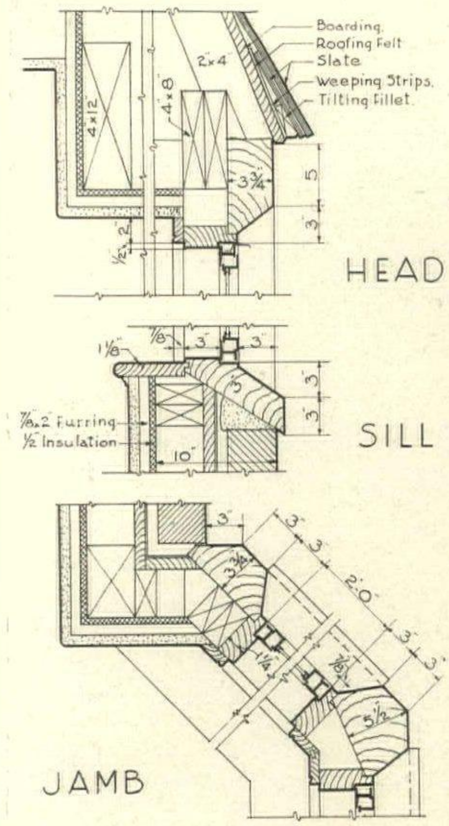
FRANK J. FORSTER AND

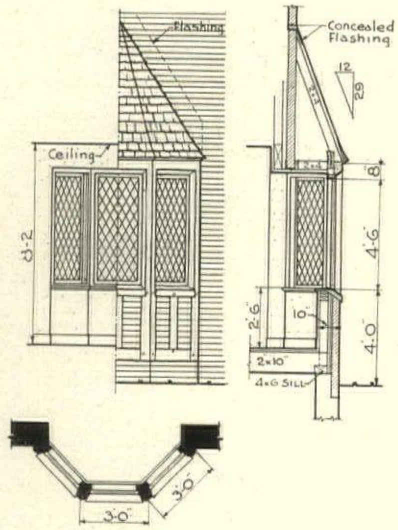
R. A. GALLIMORE, ARCHITECTS



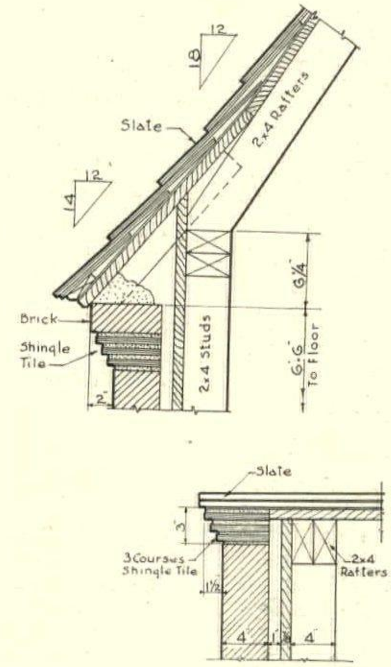
Principal elevation

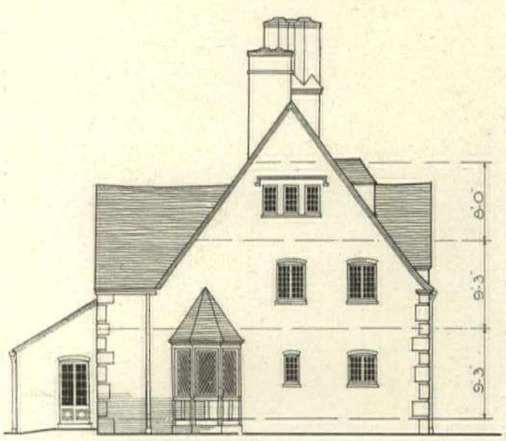
HOUSE OF ARTHUR C. EBINGER, BROOKLYN, N. Y. FRANK J. FORSTER AND R. A. GALLIMORE, ARCHITECTS



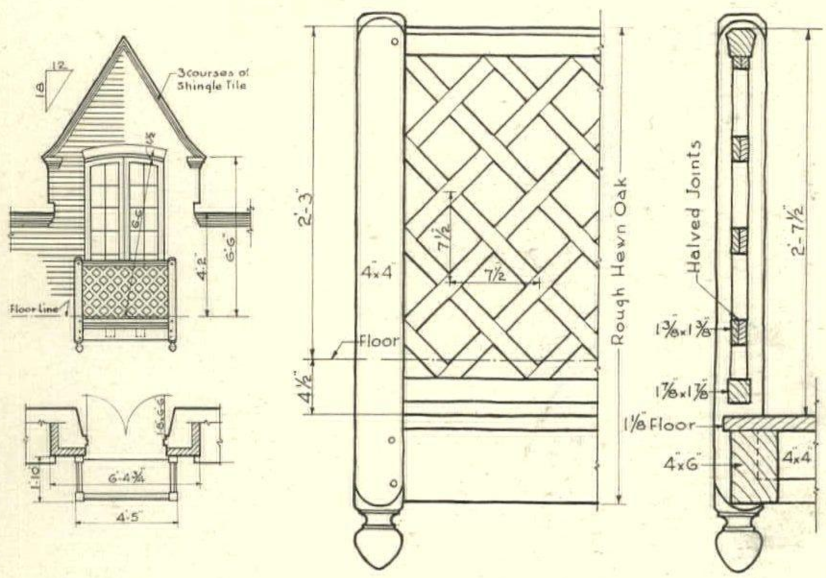


Details of dining room bay

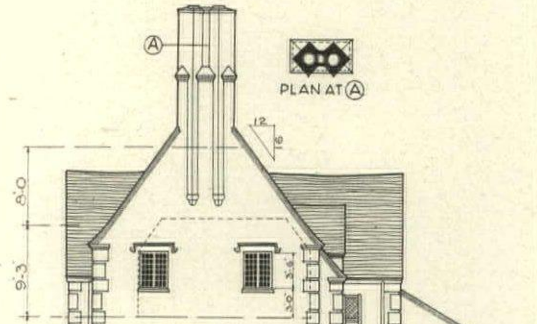




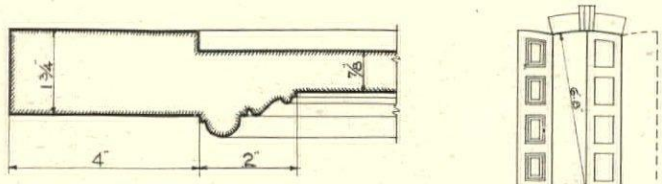
Rear end elevation



Plan, elevation and details of bedroom balcony



Front end elevation



Details of living room windows and shutters

HOUSE OF ARTHUR C. EBINGER,
BROOKLYN, N. Y.
FRANK J. FORSTER AND
R. A. GALLIMORE, ARCHITECTS

Living Room Fireplace

HOUSE OF ARTHUR C. EBINGER, BROOKLYN, N. Y., FRANK J. FORSTER AND R. A. GALLIMORE, ARCHITECTS

Recapturing the Small House Field

BY CHESLA C. SHERLOCK

ARCHITECTS are well aware of the fact that, generally speaking, the profession has "lost" the small house field. It is not my purpose to dwell upon the reasons for this in detail, but rather to emphasize the points where, it seems to me, fatal errors have been made. By giving due consideration to them, the profession may be able by concerted action to recover the ground that has been lost.

It has always seemed to me that architects have made three great mistakes in their relation to the small house. Two of these touch upon the profession's technical concern with the small house problem.

Perhaps the least serious of them is the architect's failure to exercise rigid control of specifications. I know the objections to this. And I know also how easy it is for human nature to follow the course of least resistance. But it was a fatal day—so far as the small house field is concerned—when the architect first wrote into his specifications the words, "or equal." It enabled the great evil of substitution to rear its head, to destroy piecemeal the architect's original conception and gradually to snatch away from him all professional control.

The architect figuratively shrugged his shoulders and asked, "Am I my brother's keeper?" It was the easiest way out of a difficult situation. When I have demanded definite specifications, architects have asked me, "How am I to know exactly what materials or equipment will be preferred?"

"But," I would persist, "when you conceive a bathroom, for instance, are you thinking in a hazy, general way, or do you have a definite model of tub and fixtures in mind?"

"Definite, of course."

"Then convey that definite, concrete picture to your client. How can he guess what you have in mind? How can you be definite with those 'or equal' clauses in your specifications? They, on the other hand, permit the chiseler and the price-cutter to come along and bust your specifications so far as your concept is concerned."

I could give dozens of instances where that actually happened in my own experience. The builder-owner would be agreeable at the time, especially if there were an immediate prospect of saving a little money. But sooner or later the time would come when the owner would rue the bargain and wish that the better materials and equipment had been installed. And, human-like, he would blame the architect.

The plea that other manufacturers would not like definite specifications is, in my judgment, an excuse and not a reason. I have been through that battle with manufacturers many times; and not in a single instance when the reason for so doing was explained, did a single manufacturer continue to object.

The real competitor of the manufacturer having national distribution is not the manufacturer likewise having national distribution. The one feared is the local concern which makes a product "just as good" and which is manufactured to sell at a lower price. Manufacturers of trade-marked materials and equipment welcome any attempt to curb the evil of substitution, because they see it as a friend in need.

The architect, on the ground locally, should know what materials and equipment are in local distribution; and it is perfectly natural, when making up his specifications, that he should think in terms of them. But he comes to a final choice within keeping of the needs and desires of his client. Very well. Let him have the courage to put it down! Only in this way can he protect his client and assert his authority.

However, the ambiguity of the small house specification has had less to do with the architect's present plight in the small house field than his second technical mistake—the matter of supervision. Lack of supervision has lowered the professional architect to the level of the small house draftsman. I know—and so do you—that supervision is the greatest stock-in-trade that the professional man has to offer. It is, in the final analysis, *the* service that identifies him as an architect and distinguishes him from a mere designer. Very well! Then let him exercise his professional prerogative on every job however small!

Architects must admit that the drawings and specifications of a building are the least important part of the building itself. Every line and every paragraph must be delineated in actual materials before the owner can write "finis" to his building adventure. For the majority of owners, building a small house is an important adventure. But by that same token most of them are not capable of interpreting in solid stone and brick, wood and plaster the terms of the design and specifications. And the builder, if left to his own devices will, understandably, produce an interpretation based upon the best service of his own interests.

Only by the architect's supervision can any design conform to his original conception. Many an owner has found this out too late and more often than not blames the architect for being derelict to his duty.

I am speaking out straight from the shoulder, because for nearly fifteen years I have stood by—on the active side-lines as it were—and watched these two failures slowly undermine the architect's prestige as a professional man in the small house field. When the architect failed in these two particulars, the economic or practical need for his services evaporated. It is little wonder that the hack designer and jerry-builder soon crowded him out.

Another reason for the gradual breakdown of the architect's professional standing in the small house field has been the misguided attempt to make architecture exclusive. It is all very well to be proud of one's profession and do all things possible to maintain and elevate its standards—that's one thing. It is quite another thing to make it so exclusive that the public, which really needs services the profession can offer, is held rigidly at arm's length.

The aloofness of the majority of architects toward the possibilities of the small house field constitutes the third mistake that architects should correct. From a misunderstanding of what the small house market really can mean to the profession, architects have—whether consciously or not—shunted the public straight into the offices of the speculators. In most instances these gentlemen received the small home owners with open arms. The public got its house. But it was an attenuated version of the real thing often designed by architectural hacks as a furtive kind of pot-boiling.

I BELIEVE the small house field can not get along without the architect. But it is not the duty of the prospective small house builder to seek out the architect and implore him to attend to his wants. A few tried that in the old days and did not get the reception that the public expects from a professional man.

I believe, rather, that it is the duty of the architect to make his services indispensable to the building community. He can make the building community conscious of that need which he, himself, recognizes, and which I recognize. But he must "carry his message to Garcia." Garcia will not seek him out.

I have been told in the past that such an effort would be contrary to the code of ethics. If so, then the code should be amended or junked! I believe, however, that it is possible for the architects of the nation to carry their message to the building community—and I refer to the small house field—in a thoroughly ethical and dignified manner. They can make every future builder conscious of the desirability of their services; and the public will hold them in higher professional esteem than in the past.

How can this be done? There are several ways. The simplest way would be to band all the architects in one great national body. Let them undertake a dignified, but thorough and comprehensive campaign to acquaint the public of its need for their services. It is the only way to recover the lost ground.

The campaign, supported by each and every architect, could be financed at small expense to each individual member. The copy appeals should stress the outstanding service which the architect has to offer—as distinguished from the mere designer—*supervision*. It should be frankly educational in theme. In the hands of the proper people, the copy appeal could be made alive and vital to every prospective home builder.

The campaign should be thorough, comprehensive and continuous. Sentiment for home ownership would be a helpful appeal also. It would build good will for the profession among the manufacturers and prospective home builders. It would identify the architect with that most universal desire of the family—to have a home of its own. It would insure that when the idea of a home entered the mind of a prospective builder, the need for the architect would not be forgotten. It would aid in building up in the minds of the public the habit of building individual houses instead of buying them ready-made from the speculative builder.

The place of the architect as the master technician whose seal of approval means comfortable living under one's own rooftree could be driven home.

This general campaign should be followed up locally by putting every architect on the firing line to keep up a barrage of publicity to tie the thing down locally. I do not mean just free local newspaper publicity; that is often worse than useless.

Theodore Roosevelt once said that "every man owes a portion of his time to the upbuilding of the profession to which he belongs." How many architects have spent much time in their communities upbuilding their profession in the minds of the public? That is the sort of publicity I mean. Send the local architect before local clubs. Let him appear before the schools and high schools and on the radio. Let him give interesting and worth while lectures which look to a better understanding of the vital necessity of the profession to the community. Those who are especially competent can prepare publicity articles that tie right down at home.

I believe the time to do this is RIGHT NOW. Unless the architectural profession acts NOW, the coming boom in the small residential field will entirely escape it; and another crop of jerry-built houses will be foisted upon the building community. Architects owe it not only to themselves, but to the country, to step forth and assume their rightful place in society. Their failure to do so in the past only accents the present need.

The profession cannot blame the public for not using its services more widely, or for the mistakes that lie heavily across its own doorstep. These are effective bars to architectural opportunity in the small house field. Remove them; sweep the professional doorstep clean of misconceptions; put the house in order and place a new "Welcome" sign in front. Then open the front door wide and the small house public will come in.

House of Scott E. Welker, Washington, D. C., Victor Mindeleff, Architect

Beyond the City Limits

BY HARRY F. CUNNINGHAM, A.I.A.

WHEN the average architect is faced with the question of his responsibility toward the problem of the small house, he usually remarks—over his shoulder, as he runs—"Shucks, an architect can't make any money on small houses." So, the local mill, or the nearest agency of any one of several stock-plan bureaux, or the house building department of any one of several magazines comes along and furnishes plans of a sort and services to a degree; and the thing is built and occupied and even—eventually—paid for. Incidentally, somebody, somewhere, pockets a modest honorarium that appears, ultimately, in the shape of shoes for somebody's children, a gown for somebody's wife and food for somebody's family. But, the somebody is not an architect. The architect ran away from the small house.

I happen to know several architects of distinguished talents who make respectable livings, happily, doing almost nothing but modest houses—houses, that is to say, of from two to four master bedrooms. And it is rather incongruous, after all, that the average architect should run away from the small house because he "can't make any money" on it, for—as a group—architects are less devoted to the business of making money than are most other men. However slightly they may, actually, perceive the architect's serious responsibilities and obligations as a servant of Society, nearly all of the members of the architectural profession do seem to have consecrated themselves—perhaps in a spirit of blind philanthropy—to lives of helpfulness for their fellows. Why, then, do they balk at the small house, than which no type of building serves those fellows who constitute Society more thoroughly?

In the old days, the great social need of the great majority of the people for comfortable, appropriate places in which to live and love and in many cases—to labor too, was met by the craftsman. The craftsman had inborn good taste; he had a long and rich tradition behind him—a tradition of simple, beautiful forms and excellent workmanship; he was *of* the

ROBERTS, PHOTOS

Only the craftsman-architect can produce "the ideal of appropriate homes for a happy people"

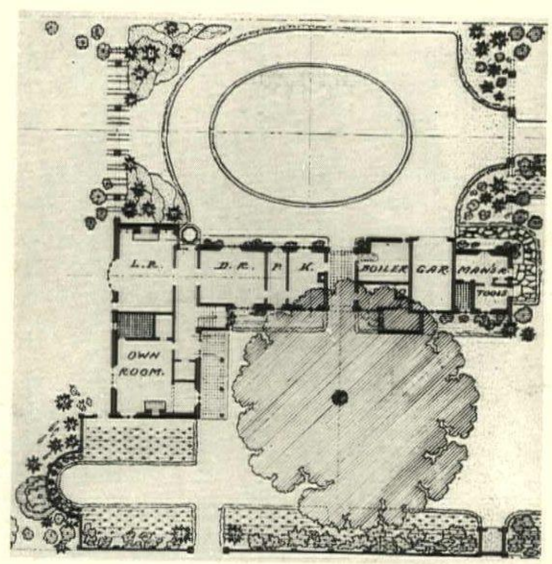
people—he lived and loved and labored much as they did. Hence, he understood their needs and desires and he knew how the needs should be met and how the desires could be satisfied. In our own country, the people's needs were being met and their desires satisfied—insofar as their homes were concerned—by the craftsman, until well after the American Nation was established. But, with the growth of the country, the craftsman became the industrialist and his children became slaves to the growing mass-production of miscellaneous non-essentials. The craftsman spirit flickered and fluttered and died out as any other flame which is not fed will do.

The mill and the speculator and the stock-plan bureau took the craftsman's place in the designing and building of houses for a people whose interest in the integrity and the individuality of the family was growing less and less; and the ideal of appropriate homes for a happy people ceased to exist. The majority of the people seemed to have grown unconscious of the existence of any very definite or very pressing needs that had to be met, or of any very earnest desires which cried out to be satisfied.

And, as Society was developing, this was not at all remarkable, but quite inevitable; the mass-production of standard types of dwelling houses was entirely in line with the growing habit of mass-production of everything else. I have before me some copies of AMERICAN ARCHITECT* for 1847 and 1848. In these old magazines one finds "Original Designs for Country Residences adapted to the Taste & Circumstances of the Merchant, the Farmer & Mechanic." Design No. 5, for example, is perfectly illustrative of what the stock plan was, and is, and evermore shall be. Of course, there is a central hall with an important stairway, set between a large kitchen and a larger parlor. There are four bedrooms upstairs, without sign of closets, baths or dressing rooms. One suspects—judging from these designs "adapted to the taste & circumstances of the Merchant, the Farmer & Mechanic"—that the people of those ancient years neither bathed nor dressed, but spent all of their days running up and down the imposing central stairway and all of their nights sleeping in one or another of the four bedrooms, with their clothing draped over the black varnished mantel—since no hanging space was provided. Obviously, they ate in the kitchen, since the "taste & circumstances" did not admit of a dining room or even a modest "dinette."

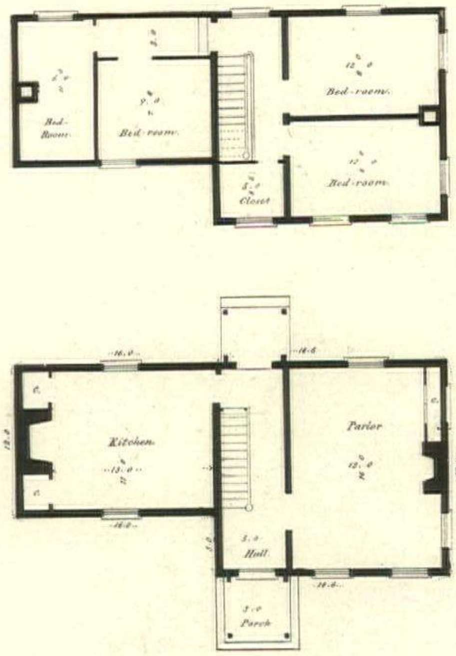
*The reference is to a pamphlet published monthly by C. M. Saxton, New York, which contained stock plans, details and specifications of houses designed by Ritch & Grey, New York architects. The pamphlet was not a forerunner of AMERICAN ARCHITECT. This magazine was founded as a professional journal of architecture in 1876 and published by James R. Osgood & Co.—Editor.

HOUSE OF SCOTT E. WELKER, WASHINGTON, D. C., VICTOR MINDELEFF, ARCHITECT



Actually, this sort of thing seems to have established the "taste" of the merchant, the farmer and mechanic, and the ease with which *taste* could thus be acquired seems to have had a singular appeal to many people, for similar "designs" were scattered all over the land. And these God-awful things seem to have had the power of propagating themselves and even expanding their progeny into stores and office buildings, for these too—with the same weird mouldings and the same painted and varnished woodwork—were (and still are) spread all over the face of the country. Here we have—as we shall always have when standard types secure a strangle-hold upon the "taste & circumstances" of the people—a repetition of old habits, without compensation in the shape of reproduction of old beauties.

The average architect, now-a-days, when he timidly and unwillingly undertakes a modest house, repeats the same old habits that have made the stock-plan stock. The fact that Society has outgrown many of these old habits long ago, seems to have passed, unnoticed, right before the noses of everybody. What, for instance, is the sense—in a modest house—of a large central hall with an important, imposing and expensive stairway? People who live in modest houses no longer live in a manner that justifies this space-consuming detail. What is the use of a pantry in a modest house wherein the number of the servants can be counted on one finger and that, often enough, the finger of a man who has lost both arms? Modern kitchen arrangements can employ space so efficiently and so economically; vent flues dispose of cooking odors so thoroughly; that the imaginary seal of the two pantry doors (at least one of which was always left open) is as economically useless as it always was actually. For a Society which, happily, loves to bathe spaciously and splashingly, why do we persist in planning minimum bathrooms in which it requires the talent of a jig-

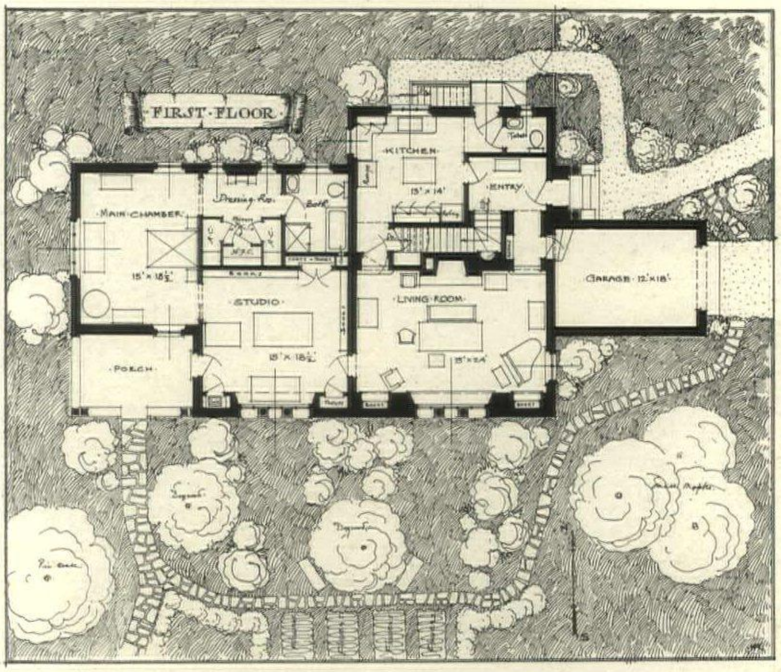


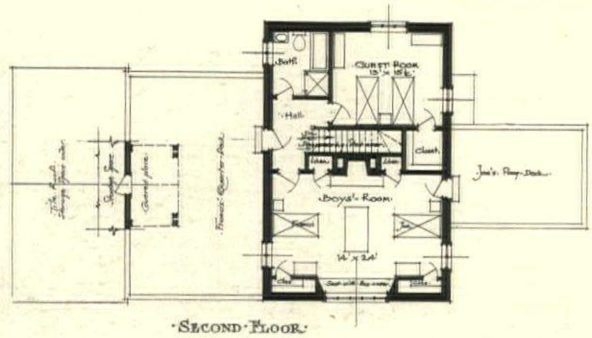
saw puzzle expert to figure out the possibility of the bathroom's being occupied by a bather and a door at one and the same time? And for a Society that loves to dress and go about rather gorgeously, why do we so seldom recognize the advantage, the comfort and the downright necessity of a dressing room, at least for Madame? Why doesn't someone take the old central hall and grand stairway, the pantry and all the rest and throw them into the discard, utilizing the space—and the money—thus saved for large, airy bathrooms and an occasional dressing room? Stock plans cannot do these things. They can only do—as before—the same awkward things in the same inefficient fashion. They can only repeat the old habits and, correspondingly, neglect possible new comforts, new beauties and new delights.

ONLY the architect can properly do these things and the thousand and one other things that have got to be done with the modest house. And the only architect who can do these things is that one who earnestly and faithfully makes each small house problem *his* own problem. The architect has got to live with and for his friends and neighbors; he has got to live *in* the house he designs all the while he is designing it. Usually, a busy architect, faced with a small house problem, turns it over to one of the young men in the office and goes on with his golf—or what have you. He thus turns what is actually the most important phase of architectural practise into the inexperienced hands of one who has had no opportunities for actual contact with the sort of living for which he must provide an environment.

The architectural schools shun the small house rather completely. It is beneath the notice of those centres wherein casinos are planned for the shores of great lakes and palaces are designed for exiled monarchs. I know of but one school in which real attention is given to modest domestic architecture; and the registration of that one is limited to women. Even here, I suspect, more attention is paid to the matter of "Styles" than to the more significant one of style. Which reminds one of the deplorable fact that, even when the average architect does undertake a modest house, he seems to start by determining the "Style" for the exterior and then tortures some stock plan or other into an unwilling and inefficient compatibility with the pre-determined "Style." A better way—might it not be the only way?—would be, of course, for the architect to learn the particular manner in which the family for which the house is being designed lives and loves and labors, and then to devise a plan to fit that manner of human living. The "Style" of the exterior would determine itself logically and inevitably from the economic-social plan that meets the family's needs and satisfies its desires. Thus the architect would become—as he, by every right, should become—an important factor in the re-creation of a better family life for the people of modest means. He would come to create for normal human beings such efficient, comfortable and beautiful homes—as distinguished from mere houses—that the people would want to spend much time in them instead of spending, as at present, most of their time elsewhere.

Of course, much education will be necessary before the architect will have many opportunities in the small house field. The stock-plan bureaux must all be relegated to everlasting Limbo. The public must be educated to a desire—a demand—for individual attention. One scarcely knows how to accomplish such education on a large scale. I know, well enough, how to do it on my own personal scale; but the question is one of national importance, not





·SECOND·FLOOR·

Far removed from the outside world, this house was designed to be lived in. The manner in which economy has been achieved in non-usable space is a challenge to any designer. The house on facing page is a typical stock-plan house of the late 40's designed "to the taste and circumstance of the Merchant, the Farmer and the Mechanic"

one of personal selfishness. Such "educational" efforts as have been made, thus far, in the small house field, by magazines, Government Bureaux, broadsides from stockplan agencies and such, have failed. They have done even worse than failure, for they have aggravated the lazy willingness of all of the Joneses to do exactly as all of the Smiths.

SOME sort of counter propaganda must be devised. Perhaps, in each community, some brave architect has got to consecrate himself to the modest house problem and attend to his own educational program which will find and educate his public. And the public must be educated, not only to demand this individual attention, but also to be willing to pay extra for it, as one is willing to pay extra for any other quality product. The public must be educated, also, to a readiness to foster and develop the family individuality and the family integrity which such individual attention calls for. Finally, the architect himself must be educated to an understanding and an appreciation of all that which this excellent attention to family individuality involves; to a willingness to undertake such labor for a modest profit; to an eager desire really to come into his own as an intelligent, efficient and sympathetic servant of Society—a servant who will become, actually, a leader. There are many signs which indicate that the only field in which there will be much activity, for some time, is the modest house field. Which architects are going to devote themselves to the cultivation of that field, with all of the self-examination and self-reform which such cultivation will demand?

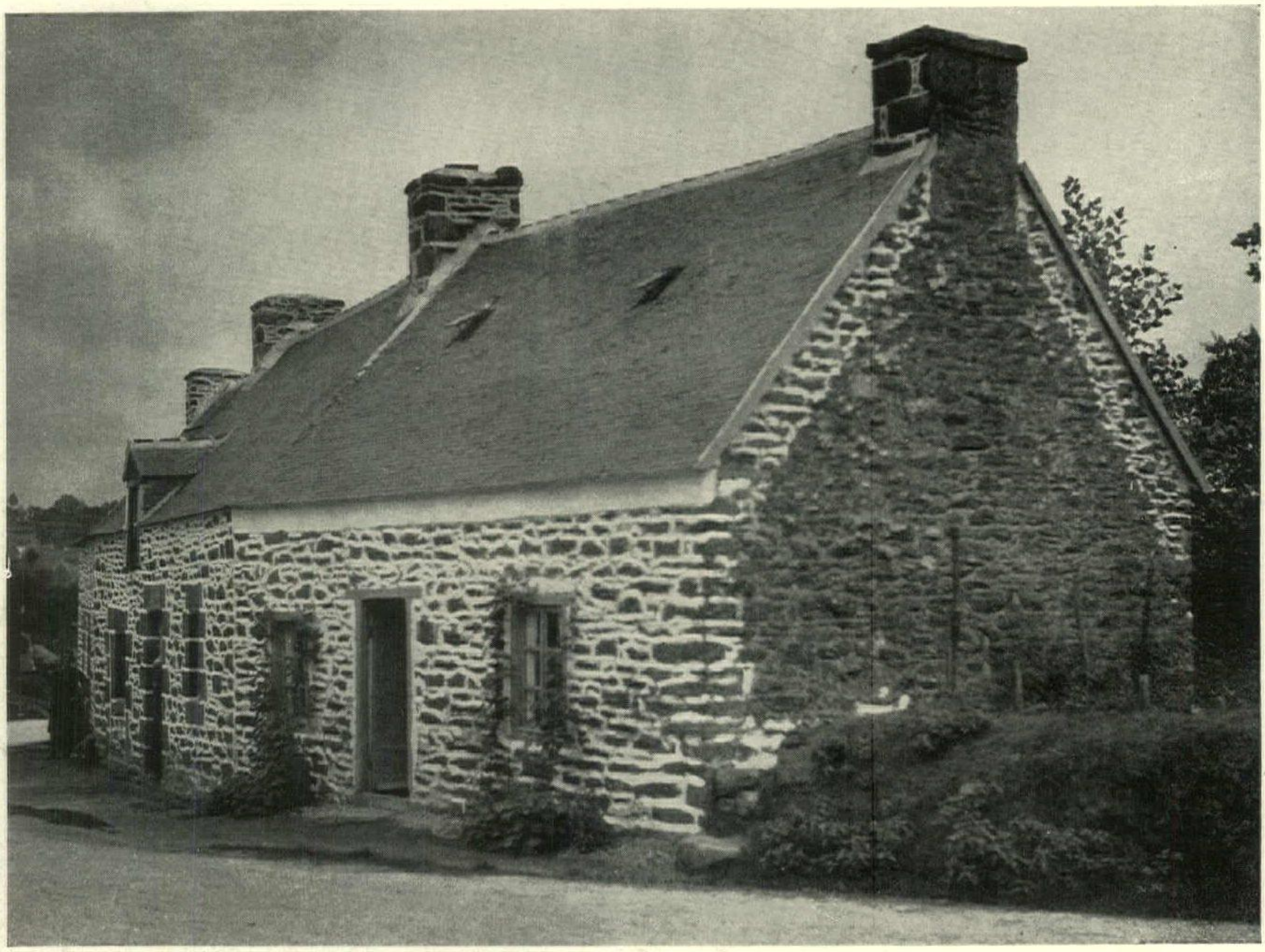
The happiest architect I know is one who has done almost nothing but modest houses all his long life through. He has always done his own work; and he has undertaken only so much work as he could do with his own head and heart and hands. He has always had his home (which has also been his studio) on the outskirts of a large city where —as he expresses it—"the concrete road ends." "I always live," says he, "at the end of the concrete road. As soon as the concrete road begins to pass my door, I move further out."

I know of no other architect—certainly there is none among the several hundred whom I know well —who has so thoroughly enjoyed the artist's threefold opportunity to delight himself, delight the world about him and poke fun at those who will not understand. He does efficient, intimate, individual and beautiful small houses. Now and then he does a rather large house; but he never loses the intimacy, individuality and beauty which seem to flow, easily and naturally, from his fingers through his pencil.

AND I, for one, am going to return to an emulation of his happy example just as soon as I can gather enough sheckels to build a small house *without* central hall and pantry, and *with* an efficient kitchen, large airy bathrooms, a dressing room for my Lady and a studio for myself. I doubt if I shall have a telephone; and I am sure that I shall have but one car and that a very small one. When it is all finished I shall invite my little world in for a round or two of cocktails and a view of what an architect can do in the way of meeting the needs and satisfying the desires of a family whose manner of life, love and labor he knows and understands. How many of you will join me in that Gay Adventure? In thus doing you will *not* make a lot of money. But you *will* earn a respectable living; and you *will* earn for yourself a place of honor in your own community and, perhaps, beyond. Will any artist who dares to be honest with himself ask for more?

FARMHOUSES IN FRANCE

from a collection of
photographs made by
FRANK J. FORSTER, A.I.A.



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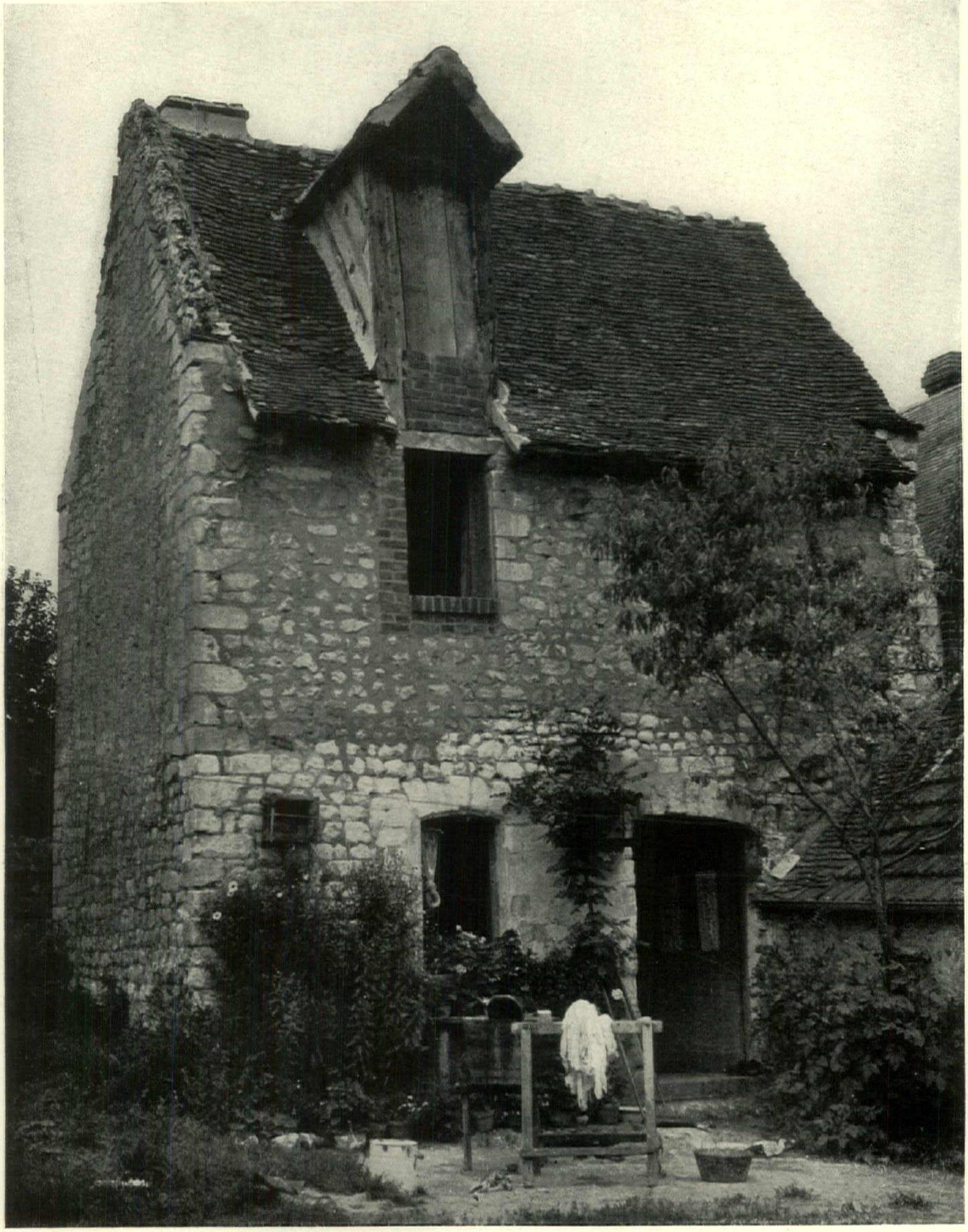

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Small House Architecture on a Business Basis

Success in the small house field calls for business-like methods of salesmanship and office management. This article, based upon interviews and correspondence with architects, tells how three offices have successfully developed a small house practice

BY ROGER W. SHERMAN

THE statement has been made that the small house is a problem outside the scope of the average architect's office. It has been reiterated so often that one might easily assign its origin to some well-organized body having a keen interest in eliminating architects from a large field teeming with lucrative opportunity.

Probably this is not the truth of the matter. In any event, architects will be less interested in the source of such remarks than in the reasons which have brought them forth and methods by which contentions of error may be refuted. To these ends AMERICAN ARCHITECT instituted an investigation—by questionnaire and interviews—of architects' concern with the small house problem.

Editorial probing established two basic facts. First: The small house buyer, properly approached, will patronize the architect in preference to the less able vendors of a jerry-built design. Second: The average architect can profitably maintain a modest office by a small house practice.

Ordinarily the potential owners' primary desire is for a home usually far beyond his ability to buy. The consideration of investment is of second importance. Lacking knowledge of costs and techniques and with little appreciation of design, of good construction or the importance of supervision to assure both, the public can too often be sold a ready-made house with a standardized price-tag that seems to be as fortunate a compromise between dreams of grandeur and a too-shabby reality as a modest sum will procure. The average man is used to buying tangible products—not service. He wants to buy the commodity he will eventually call home with as little effort as possible.

With the small house buyer the entire transaction is largely economic. Essentially he pays a certain amount of money for the enclosure of enough space to accommodate his family. The average architect is prone to take the opposite view in the development of a small house. Whatever the facts of the case may be, the public has been led to believe that, regardless of family requirements or considerations of cost, the architect's ruling passion is design.

It is this regard of the public toward its house that has caused acceptance of building practices tending to supplant the architect in the small house field. This attitude also constitutes the public's sales resistance to the technical abilities and personalized services which are the architect's chief stock-in-trade. Conversely, therefore, the public will buy what the architect has to offer, if it can be made to realize that a better home-commodity at less expenditure will result.

Apparently, then, success in the small house field hinges largely upon the architect's salesmanship. Obviously, it is not the whole answer to the question. Professional competence can be assumed; and, as in any other line of endeavor, sales resistance is lessened to the degree that a potential client appreciates and desires the results of the architect's technical abilities and service.

The measure of a small house architect's practice is his ability to close contracts. To do so he must convince his client that his services—at a much higher price than seems reasonable to the prospect—actually represent: (1) less wasteful and more convenient arrangement of spaces; (2) a design that will enhance the resale value of the house; (3) competent supervision that will ensure good construction and less maintenance cost; *plus* (4) a saving in tangible dollars over any other arrangement by which the client may procure a house.

If the commercial aspect of small house architecture has been stressed, it is because AMERICAN ARCHITECT's investigations have revealed this as the consideration of greatest professional concern. Obviously, any expedient that the architect can exercise locally will aid him in obtaining small house commissions. Getting jobs into the office is but one operation in the cycle. Getting them out again at a profit is equally important. Briefly stated, the solution to this lies in almost total elimination of overhead and in simplification of office routine.

To those architects who hold that a small house practice can prove successful only if an architect enters the field of general building, the following paragraphs will prove enlightening. To those who do not condone this growing practice they may offer some suggestions of a practical nature from a purely professional standpoint.

MEETING THE BUILDER'S COMPETITION

To the architect who maintains a suburban office, the speculative builder and the builder working with the local realtor represent formidable competition. Clients of these builders usually assume they can save money by not employing an architect, though apparently they fail to realize that the realtor will collect a commission almost equal to the average architectural fee.

In some instances, this type of competition has become so great that an architect is forced into a choice between employment *by* the builder or—to meet competition from the standpoint of the building public—employment *of* the builder.

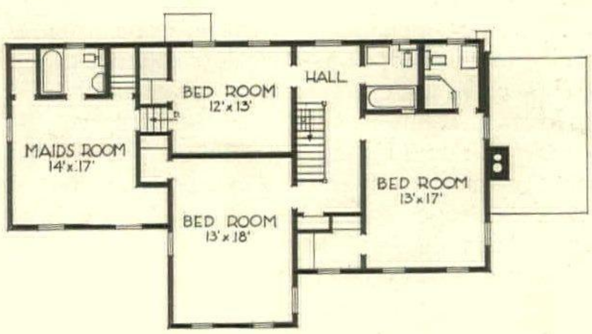
In one instance, at least, an architect has developed a practical solution of the problem. Kenneth W. Dalzell, conducts a general architectural practice in Maplewood, N. J. Some years ago he organized a realty company which buys acreage and develops it with moderate-sized houses which are offered to the public with a building service from plan to completion. The personnel of the company—which includes real estate men and builders—works under his direction. Thus the company meets the competition of the speculator and gives, in addition, the necessary architectural service.

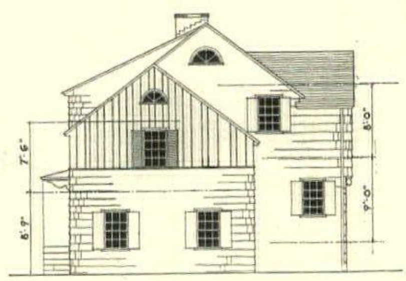
The realty organization—the Budal Company—offers a complete building service including aid in financing under one contract. The company will build on any lot within a radius of 25 miles of its Maplewood office. Several hundred houses have been erected under this plan; and the stability of their value is attested by the fact that but one foreclosure has thus far been recorded.

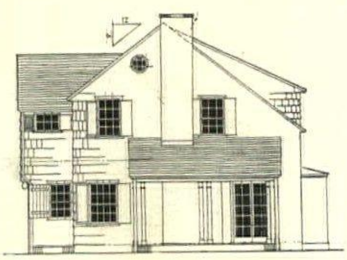
Practically, Mr. Dalzell controls the Budal Company. Professionally, his only connection with the organization is in an architectural capacity. There is no overlapping of his professional practice as an architect with his business interests in the building and development activities. When Mr. Dalzell is retained as an architect, his building company does not figure on the job. The work is given to outside contractors in the usual manner.

Offices of the Budal Company and Mr. Dalzell's own headquarters are housed under one roof, thus centralizing overhead and lessening operating expenses of each by an allocation of personnel expenses. The building company maintains a nucleus of one man who acts as superintendent, estimator, draftsman, etc. One salesman on commission represents the real estate end. A stenographer handles the telephone and correspondence for the whole office; and a certified public accountant takes care of all bookkeeping and financial transactions for all the three organizations.

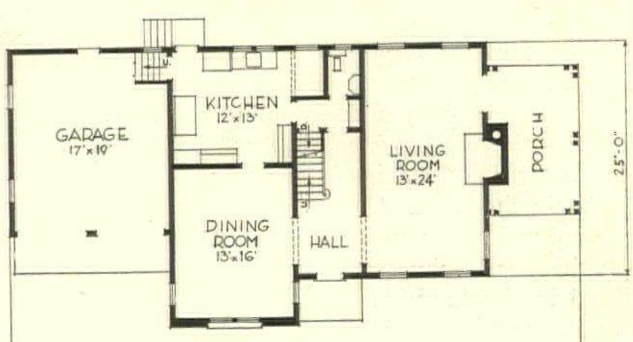
Methods of obtaining business are well organized. Advertising in local newspapers and—to a limited extent—in magazines develops leads which are followed up by personal contact. A mailing list of about 500 names of apartment dwellers who are

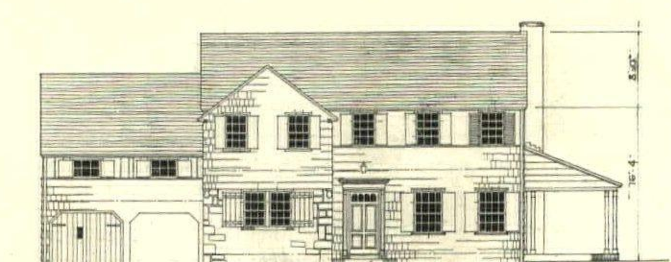


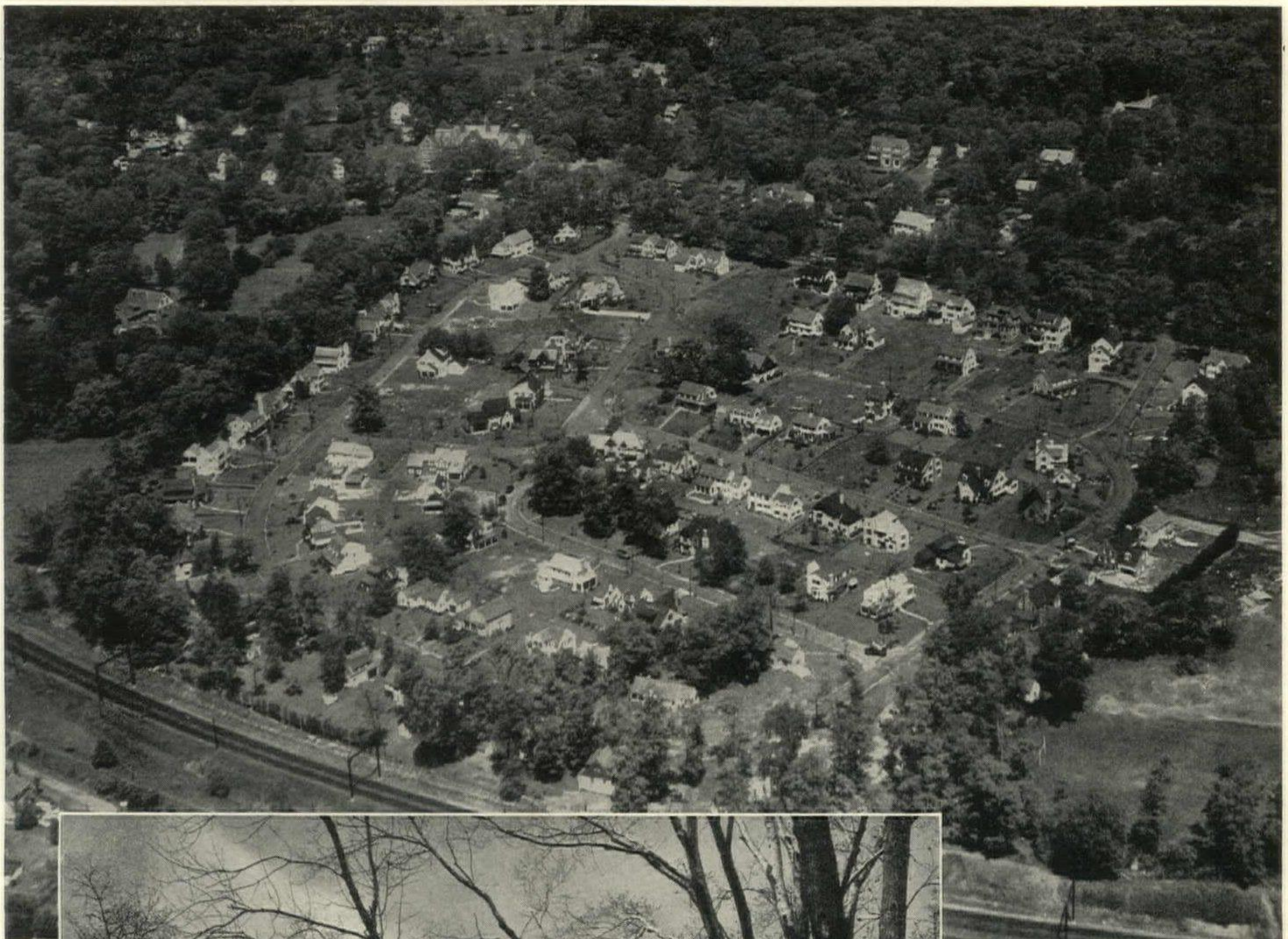




HOUSE OF GEORGE G. SALMON
MAPLEWOOD, N. J.
Kenneth W. Dalzell, Architect







GOTTSCHO CURTISS-WRIGHT

What an architect can do with a small house development is illustrated by "Knollwood," the Maplewood, N. J., project of Kenneth W. Dalzell, architect. The Budal Company, controlled by Mr. Dalzell, built most of the houses in the tract. Above, an airplane view of Knollwood. Left, house of George G. Salmon, designed by Kenneth W. Dalzell and built for the owner by the Budal Company prospective home builders receive a monthly publication issued by the Budal Co., dealing with ways and means of home ownership and building under the "Plans to Completion" method which is also described in an illustrated booklet.

When an inquiry is received from an advertisement, one of these booklets is sent out with a letter outlining the Budal Company's methods and asking for an opportunity to submit a sketch and further details. This has produced results.

Mr. Dalzell believes stock plans to be bugaboos in the small house field; and every house built and sold by the Budal Company has been individually designed for site or client. Sketches are made by Mr. Dalzell who is retained by the building organization at a regular architectural fee. These, in turn, are submitted to the client by the Budal Company with no inference that Mr. Dalzell has been retained as the client's architect.

A sketch is usually submitted together with a preliminary cost estimate which stipulates a guaranteed maximum figure and includes architect's fees, profit for the building organization and every conceivable item which, under a more haphazard system of small house building, often appear as extras.

IF the sketches are satisfactory, the client signs a memorandum contract and pays a deposit that ranges from $200 to $500, depending upon the cost of the house. This agreement provides that working drawings will be made and figured as a basis for a building contract. If the contract price exceeds the preliminary estimate and the client is unwilling to go ahead, the deposit is returned. If, on the other hand, the client withdraws for some other reason, the deposit is retained by the building company and applied to the cost of the working drawings. Many houses have been built under this procedure; and only in one instance has it been found necessary to return the required deposit.

For houses under $10,000, preliminary cost is estimated by the cubic foot method. A quantity survey is the basis for the contract figures. These latter are based on a standard specification which may be changed in detail to meet any client's special requirements. Variations of cost as applied to specification standards are constantly being revised to meet changing field conditions. By employing units that include the labor cost necessary to install various items of material, accurate estimates are easily available.

Mr. Dalzell feels that the type of organization represented by the Budal Company should fundamentally be controlled by the architect. Otherwise, he says, architects will be controlled and will have little to do with small houses except as they may determine the aesthetics of the problem. He looks upon the actual design and planning of a small house as the least important operation in its production and characterizes ignorance of practical building methods and costs as primary reasons for failure of most architects who plan small houses.

THE BUSINESS OF BEING PROFESSIONAL

Located in a modest two-room suite of a New York office building is a firm of small house architects who are now among the busiest in that city. Their minimum fee for houses under $10,000 is 10 per cent; for the majority of work they are now doing they are receiving 15 per cent; and the system they have developed constitutes one of the most practical methods of professional office practice that could be recorded.

The name of the firm is Craft, Gill and Walsh. Its success thus far—the present organization is but a scant two years old—is based upon two factors. First, each member of the firm is a specialist in small houses; second, clean-cut business methods have been applied to every step in the solution of professional problems.

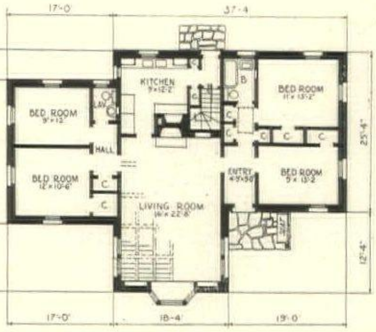
Individually and collectively the firm is opposed to the use of stock plans. Their practice is founded on the conviction that the small house is a special problem requiring a different procedure for each solution. Most of the firm's commissions have been executed for private clients.

This firm successfully meets, by sound salesmanship, the stock objection of the public to the cost of architectural service. It can prove to the client that costs are usually forecast incorrectly by the average builder and that, ordinarily, a builder's price does not include many items necessary to complete a house.

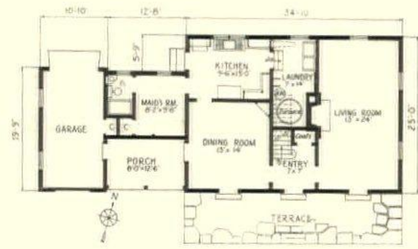
Preliminary analysis of the client's project includes even the most insignificant item that will contribute to cost. To aid in this, the firm has prepared several mimeographed forms, some of which are designed to supply definite information that may assist them in developing the house designs. Others are for the client's general information as to the manner in which the firm works. The client's budget is likewise examined, miscellaneous fees deducted from it and the absolute limit of expenditure for the house itself ascertained. Then the firm's plan of procedure is thoroughly explained.

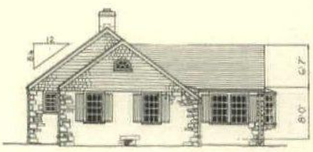
For houses under $10,000 a general contract is not usually let. The firm supervises the job under a system of separate contracts divided into five basic groups. First: excavation, grading, masonry and plastering. (Sometimes this contract is divided.) Second: carpentry and millwork. Third: plumbing and heating. Fourth: electrical work. Fifth: painting. Usually with a job of this type is included an additional agreement, called a "general conditions contract." Sometimes let on a cost plus basis and often taken by the firm itself, it is designed to include miscellaneous items not ordinarily included in the contracts already noted. This system has made possible more than usually tight, clearly defined specifications and has been found to facilitate supervision.

So far as the business arrangements are concerned, Craft, Gill and Walsh assume the functions of a

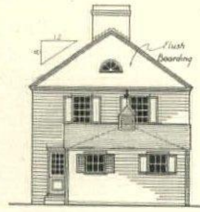


A

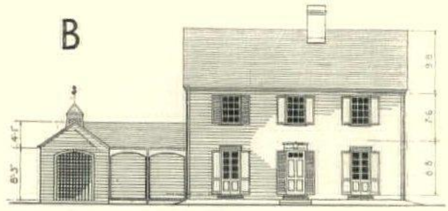




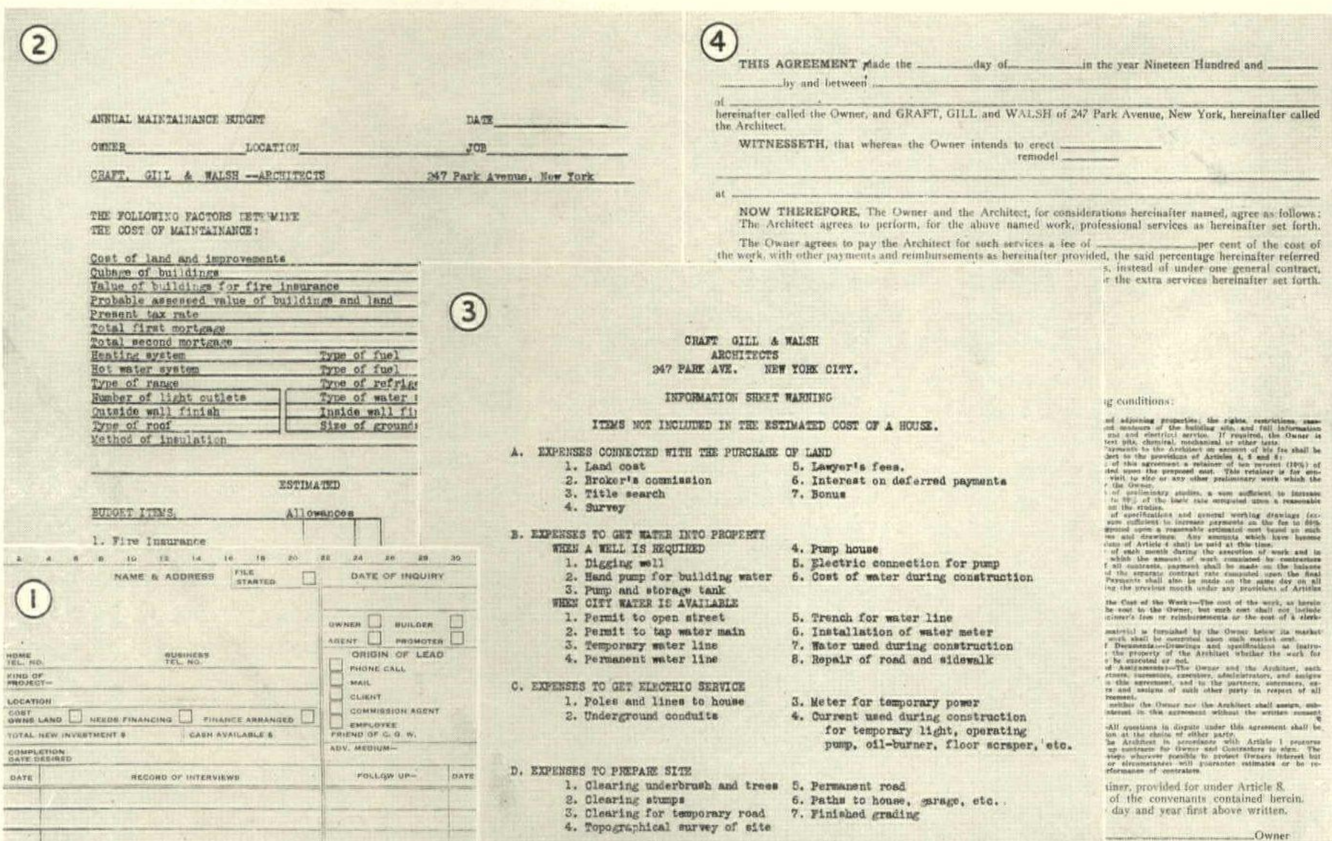
House A: Contents, 22,675 cu. ft. Cost, 1933, at Walden, N. Y., $5,175, or less than 23 cents per cubic foot.
House B: Contents, 29,194 cu. ft. Cost, 1933 at Long Island, N. Y., $7,247, or less than 25 cents per cubic foot.



B



Built under separate contracts by Craft, Gill & Walsh, architects. Costs include a fee of 15 per cent of estimated cost.



(2)

ANNUAL MAINTAINANCE BUDGET DATE ______

OWNER ______ LOCATION ______ JOB ______

CRAFT, GILL & WALSH --ARCHITECTS 247 Park Avenue, New York

THE FOLLOWING FACTORS DETERMINE
THE COST OF MAINTAINANCE:

Cost of land and improvements
Cubage of buildings
Value of buildings for fire insurance
Probable assessed value of buildings and land
Present tax rate
Total first mortgage
Total second mortgage
Heating system — Type of fuel
Hot water system — Type of fuel
Type of range — Type of refrig
Number of light outlets — Type of water
Outside wall finish — Inside wall fi
Type of roof — Size of ground
Method of insulation

ESTIMATED

BUDGET ITEMS. Allowances

1. Fire Insurance

(1)

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

NAME & ADDRESS — FILE STARTED — DATE OF INQUIRY

OWNER — BUILDER
AGENT — PROMOTER

HOME TEL. NO. — BUSINESS TEL. NO.

ORIGIN OF LEAD
PHONE CALL
MAIL
CLIENT
COMMISSION AGENT
EMPLOYEE
FRIEND OF C. G. W.
ADV. MEDIUM—

KIND OF PROJECT—
LOCATION
COST
OWNS LAND — NEEDS FINANCING — FINANCE ARRANGED
TOTAL NEW INVESTMENT $ — CASH AVAILABLE $
COMPLETION DATE DESIRED

DATE	RECORD OF INTERVIEWS	FOLLOW UP—	DATE

(3)

CRAFT GILL & WALSH
ARCHITECTS
247 PARK AVE. NEW YORK CITY.

INFORMATION SHEET WARNING

ITEMS NOT INCLUDED IN THE ESTIMATED COST OF A HOUSE.

A. EXPENSES CONNECTED WITH THE PURCHASE OF LAND
1. Land cost
2. Broker's commission
3. Title search
4. Survey
5. Lawyer's fees.
6. Interest on deferred payments
7. Bonus

B. EXPENSES TO GET WATER INTO PROPERTY
WHEN A WELL IS REQUIRED
1. Digging well
2. Hand pump for building water
3. Pump and storage tank
4. Pump house
5. Electric connection for pump
6. Cost of water during construction
WHEN CITY WATER IS AVAILABLE
1. Permit to open street
2. Permit to tap water main
3. Temporary water line
4. Permanent water line
5. Trench for water line
6. Installation of water meter
7. Water used during construction
8. Repair of road and sidewalk

C. EXPENSES TO GET ELECTRIC SERVICE
1. Poles and lines to house
2. Underground conduits
3. Meter for temporary power
4. Current used during construction for temporary light, operating pump, oil-burner, floor scraper, etc.

D. EXPENSES TO PREPARE SITE
1. Clearing underbrush and trees
2. Clearing stumps
3. Clearing for temporary road
4. Topographical survey of site
5. Permanent road
6. Paths to house, garage, etc.
7. Finished grading

E. EXPENSES DURING CONSTRUCTION
1. Blasting rock
5. Liability insurance

(4)

THIS AGREEMENT made the ______ day of ______ in the year Nineteen Hundred and ______ by and between ______

of ______
hereinafter called the Owner, and GRAFT, GILL and WALSH of 247 Park Avenue, New York, hereinafter called the Architect.

WITNESSETH, that whereas the Owner intends to erect ______ remodel ______

at ______

NOW THEREFORE, The Owner and the Architect, for considerations hereinafter named, agree as follows: The Architect agrees to perform, for the above named work, professional services as hereinafter set forth.

The Owner agrees to pay the Architect for such services a fee of ______ per cent of the cost of the work, with other payments and reimbursements as hereinafter provided, the said percentage hereinafter referred ...s, instead of under one general contract, ...r the extra services hereinafter set forth.

...g conditions:

...iner, provided for under Article 8.
of the convenants contained herein.
day and year first above written.

______ Owner

______ Architect

Business forms of Craft, Gill & Walsh. **I.** Prospect card; **2.** Maintenance questionnaire to help determine detailed budget expenditures; **3.** Client's information sheet listing items not usually included in a contract price; **4.** Simplified contract between architect and owner building contract broker, their commission for this being 5 per cent in addition to a basic fee. This is compensation for keeping labor and material records for every trade on each job in addition to the usual business operations performed by the average architectural office. The firm buys no materials nor does it contract for any of the job labor except in performance of the general conditions contract.

Dealings with clients are attended to as meticulously as details of the jobs themselves. No project goes through the office without due execution of a contract form; and any changes ordered verbally by the client are confirmed in triplicate forms, one each going to the job, the owner and the office files. The contract form between owner and architect—adapted from the standard A. I. A. form—contains, in addition to the usual clauses, a schedule of set charges for every extra condition that might arise on the job and which, requiring architectural advice, should be charged for. The agreement between owner and contractor is also simplified and on the back contains the general conditions of the contract, a fact that has saved much misunderstanding and complications on the job.

THE firm of Craft, Gill & Walsh does not warm its collective office chair and wait for work to flutter over the transom. Employing no contact men or other job-getting aids, each member is constantly making an effort to bring in work. To help them a card index is maintained of every prospective small house builder who comes within their ken. Each card gives the source of the lead and contains notations regarding financing and type of house desired. The index can be revised by a system of check dates so that it shows the status of the firm's potential volume at all times.

At one time a program of advertising was instituted in both magazines and newspapers, but no commissions were forthcoming and the practice was discontinued. The contrary result has been experienced with publicity in the form of articles on economic phases of house planning and building. The firm estimates that about fifty per cent of their work has come from this source, the remainder coming as a result of personal solicitation or from no solicitation at all.

To support an office that is somewhat larger than that of the average small house architect, the firm estimates about thirty commissions under $10,000 would be necessary yearly, provided no other work were accepted. The basic office personnel includes an estimator who acts as the firm's accountant and who is also a registered engineer, two draftsmen, a superintendent and a stenographer. The firm is organized into three broad divisions of work. H. Vandervoort Walsh attends to most of the publicity and generally heads the "job-getting" department. Harrison Gill is in charge of design, production and office management; and Alton L. Craft manages the division of superintendence and construction.

CONDUCTING A SMALL HOUSE BUSINESS

There exists a host of other professional variations. Least aware of opportunities in the small house field is the individual who draws hack plans for the speculative builder. At the upper end of the scale are those architects who have recognized the business possibilities of their profession and have developed a tightly-knit, inexpensive organization that pays a handsome profit to their initiative.

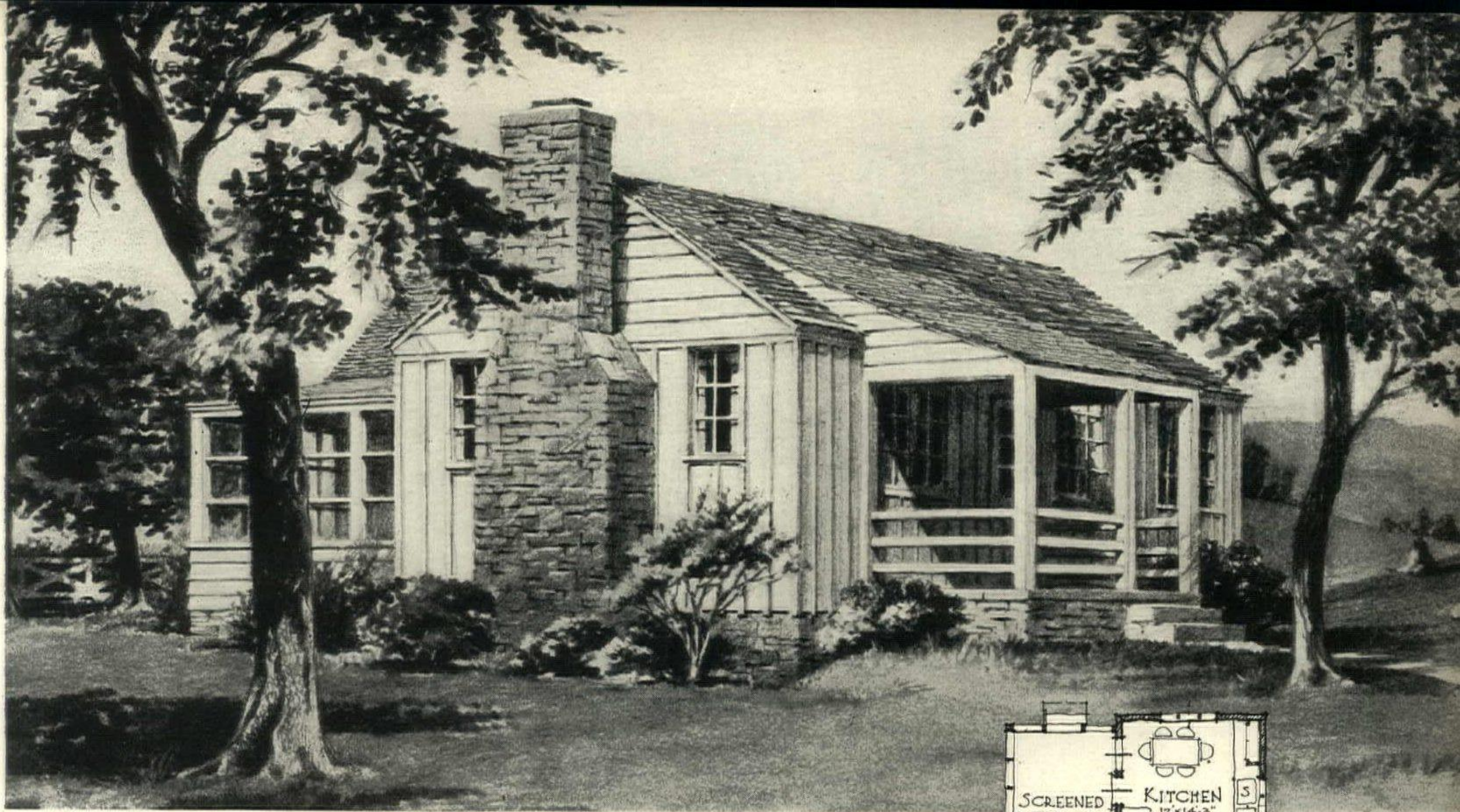
Such an individual is Randolph Evans, New York architect and small house specialist, some of whose work is shown on page 76 of this issue. His successful practice has grown in close contact with a large real estate firm. It has been nurtured by his systematic attention to the minutae of small house planning, design and construction and by the business-like methods with which all his professional dealings are administered.

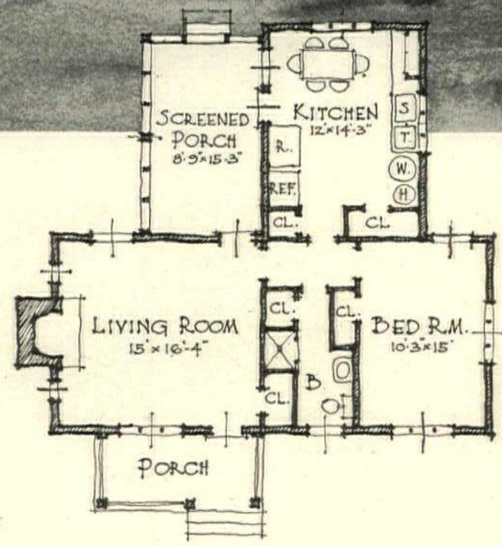
Mr. Evans looks upon the architectural practice of small houses as both a business and a profession. Small houses are regarded as a commodity which a client purchases in much the same manner that he buys a suit of tailor-made clothing. The client is entitled to know the cost and quality of what he is about to buy. He is entitled also to fulfillment of his special requirements insofar as his budget will allow.

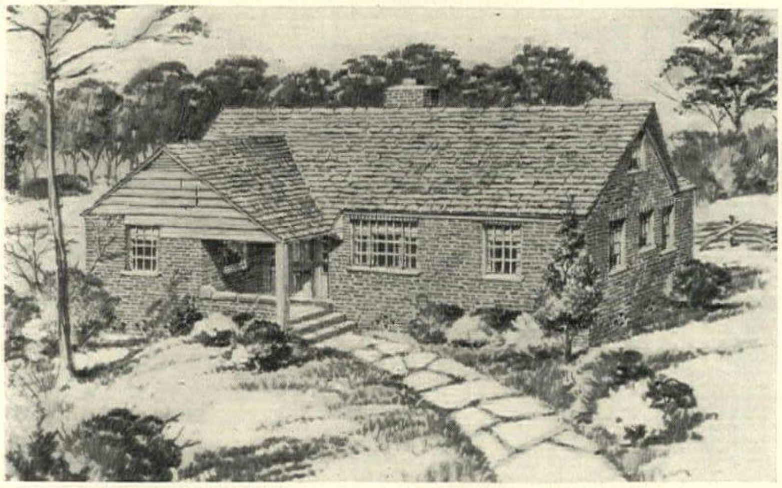
This means, so far as this architect's office is concerned, that stock plans are never stock since they must usually be changed according to the client's wishes. It means also that any profitable production of special designs must conform to the most rigid schedule of office economies. Hence, only one draftsman is employed. Mr. Evans does his own designing and some supervision, though in outlying districts he employs local superintendents on an hourly or fixed fee basis. The office—a small suite of two rooms—contains no stenographer except on occasions of extra work.

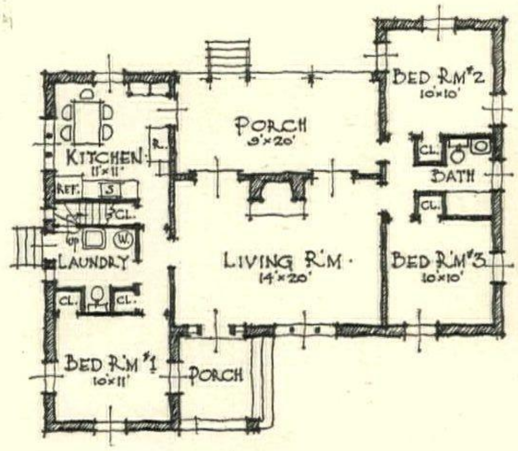
This architect also has learned from experience that office time wasted is money lost. He knows, almost to a penny, how much it costs to produce the drawings for a small house; and he knows also how much time can be spent with clients over pros and cons of individual designs. His contract specifies a flat six per cent fee and stipulates the number of conference hours that the fee includes. Time in excess of this amount is charged at the rate of $5 per hour. Included also is an inspection service, which—as distinguished from supervision—means only occasional visits to the job and reports to the owner regarding its condition.

Accurate estimation of the cost is of equal importance. Mr. Evans employs an unusual cubage method. Various cost units—constantly checked against field costs—are applied to the various parts of the house which differ in construction type. To the total cubic cost of the structural enclosure are added costs of special finish or equipment, including each chimney and fireplace mantel.







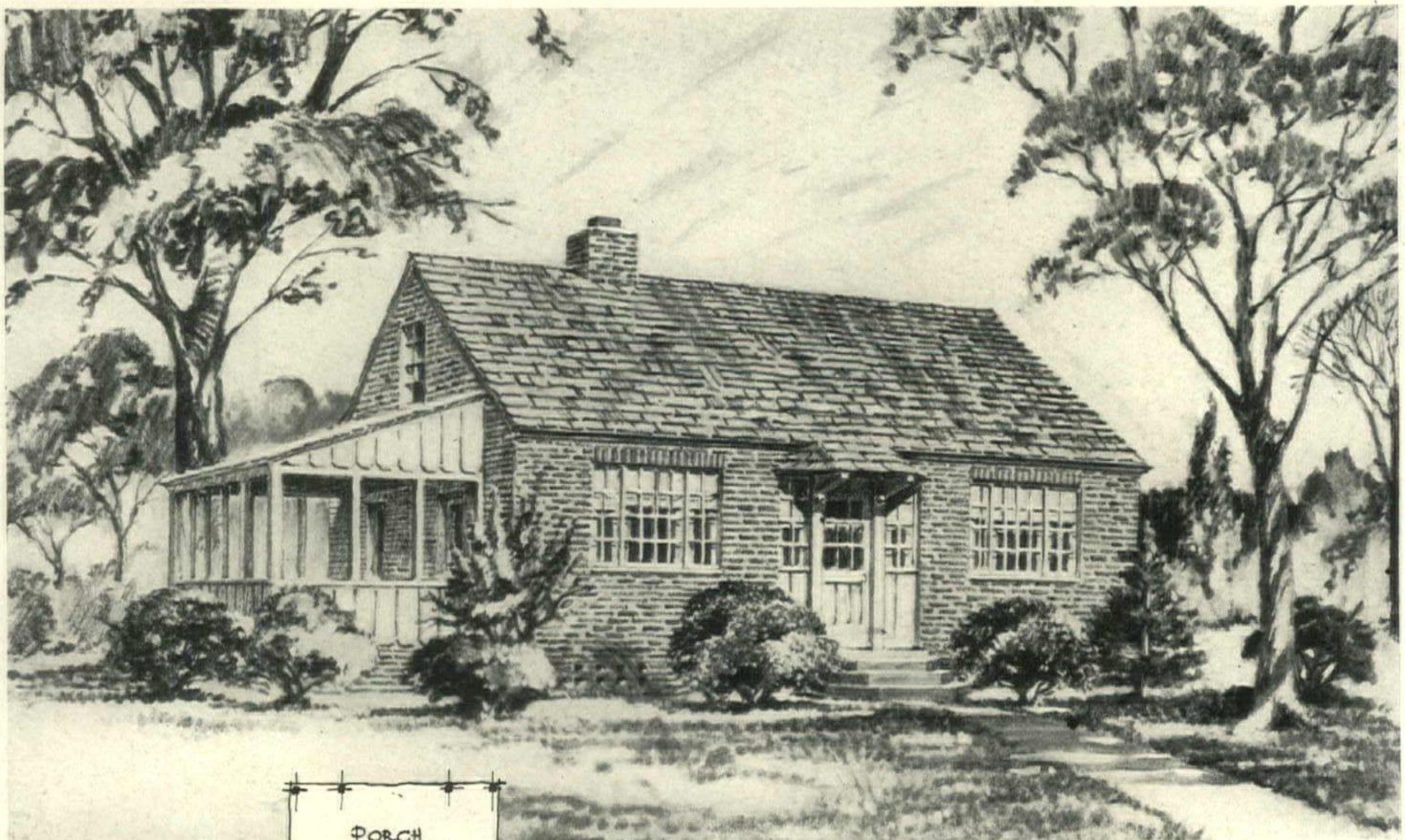


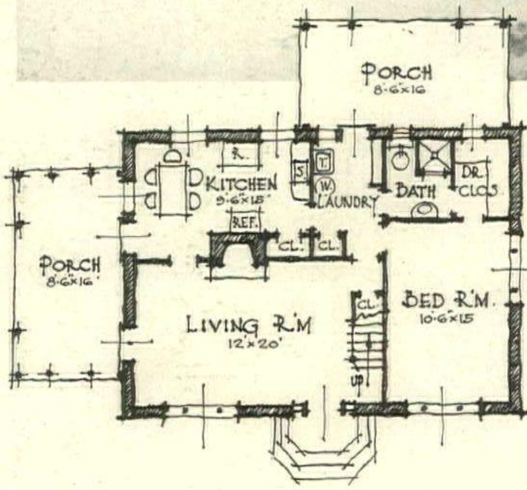
T V A HOUSES

NORRIS, TENNESSEE

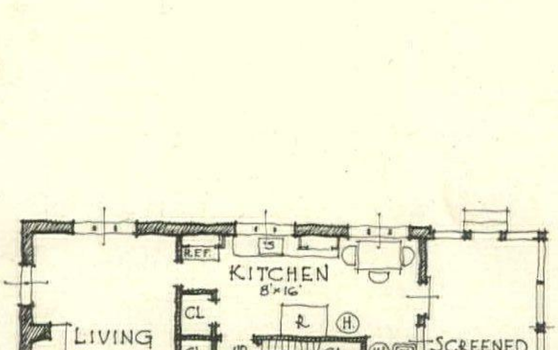
TENNESSEE VALLEY AUTHORITY
DIVISION OF LAND PLANNING AND HOUSING
EARLE S. DRAPER, DIRECTOR

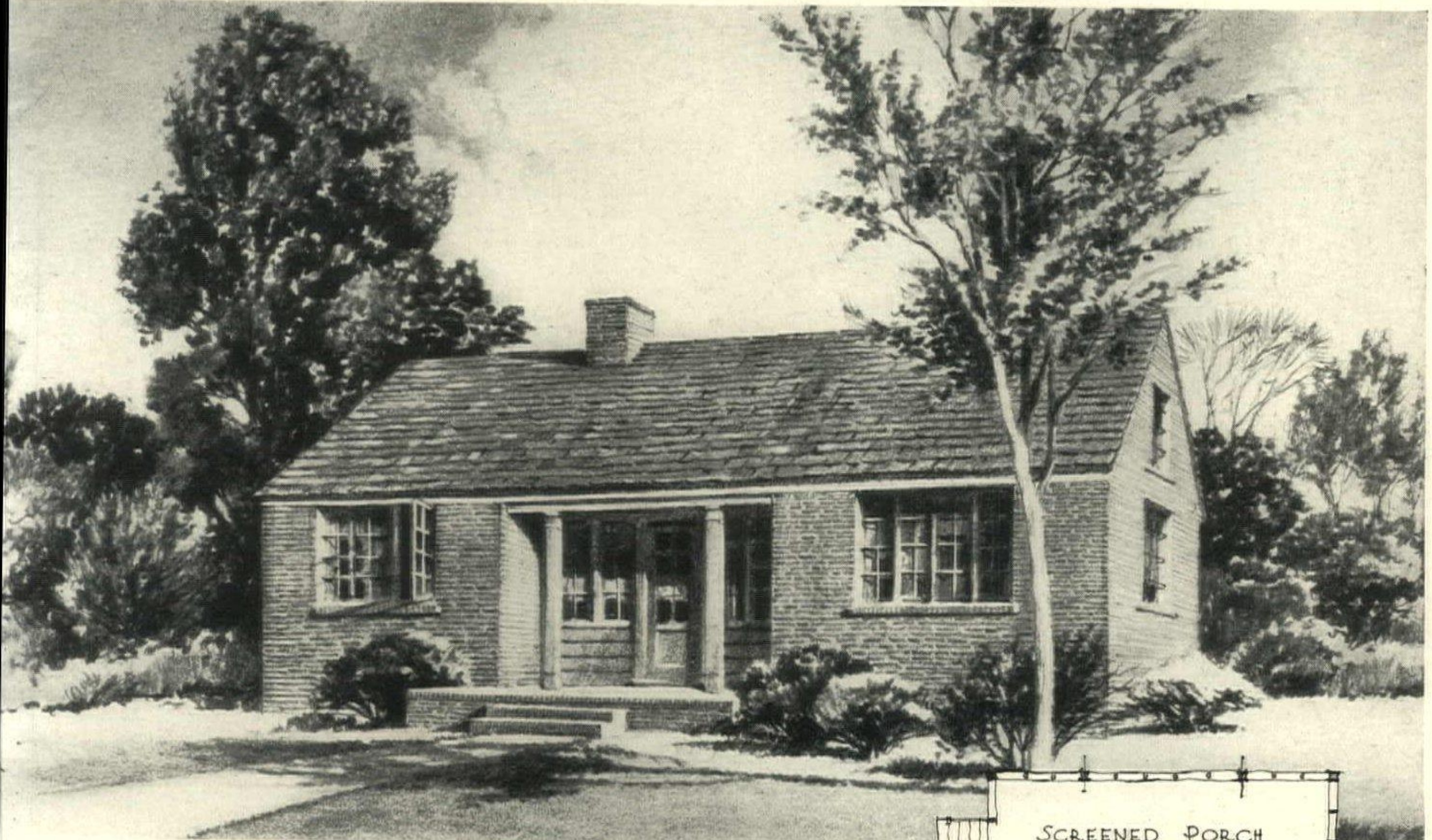
The character of houses native to the locality has been made the basis of the design of the houses being built at Norris. Houses are completely equipped with electric range, refrigerator, and hot water heater with a heating unit in each room. Cubic contents, house at top of page, 11,830 cu. ft.; house below it, 19,750 cu. ft.

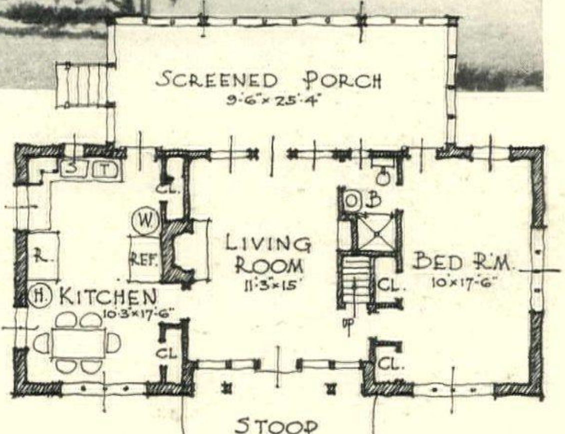




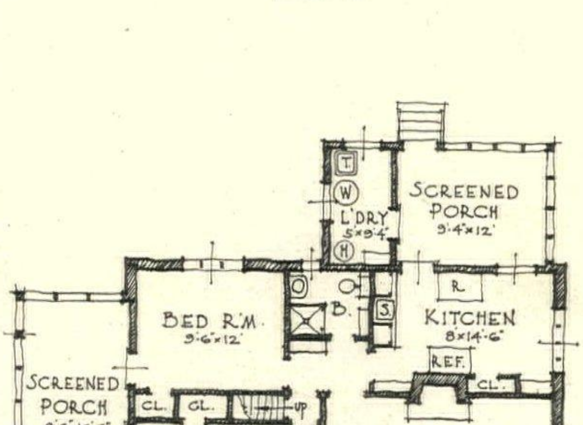
House above contains 17,187 cubic feet. The house below is approximately the same size. None of the houses built at Norris contain basements. In most cases attics are provided

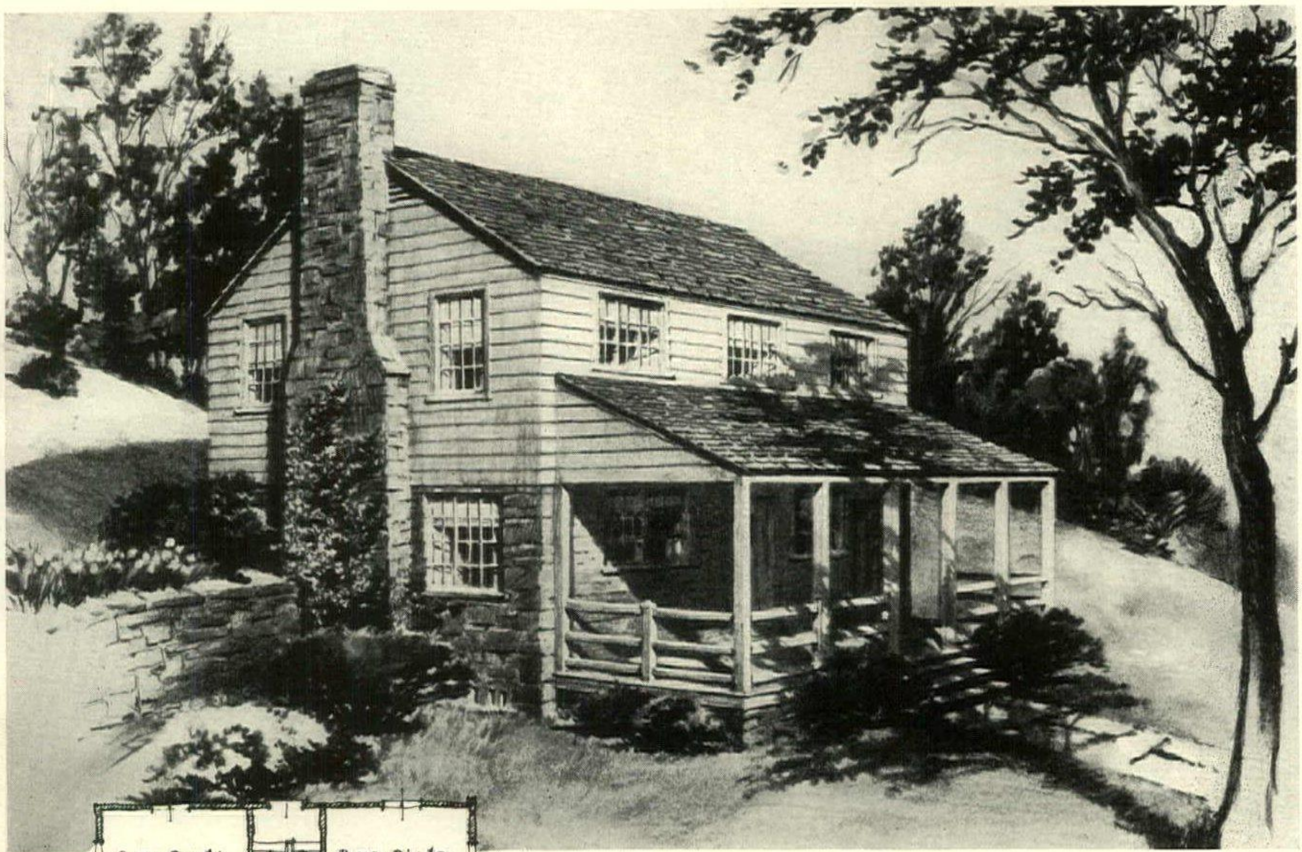


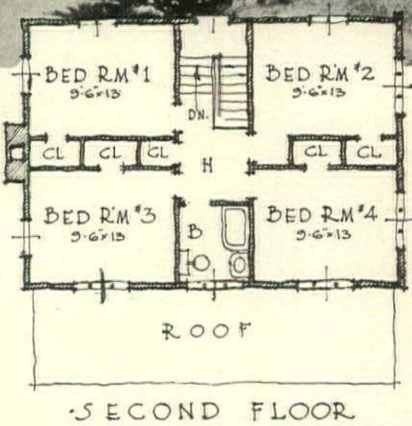




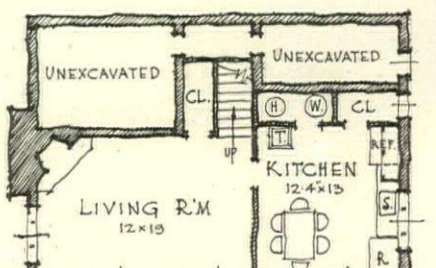
Local materials, brick, stone and wood have been selected for the construction of the houses being erected by the Tennessee Valley Authority. Useful space governs the plans



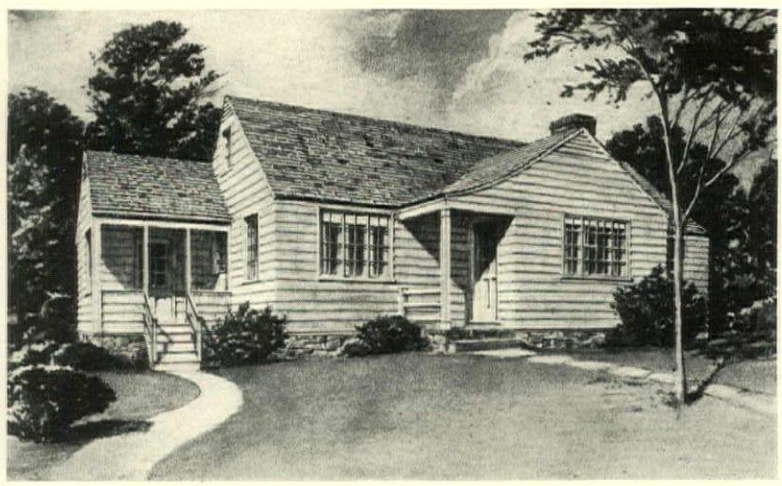


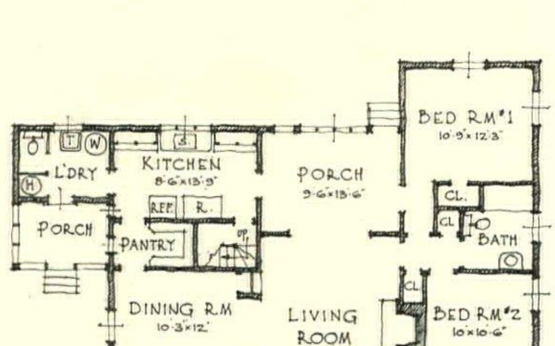


·SECOND FLOOR



·FIRST FLOOR





T V A HOUSES, NORRIS, TENNESSEE
TENNESSEE VALLEY AUTHORITY
DIVISION OF LAND PLANNING AND HOUSING

Architect's Decision Is Final If—

BY CLINTON H. BLAKE

Blake & Voorhees, Counsellors-at-Law

IT is obviously important that the practicing architect have a workable knowledge of the fundamentals of the construction contract. By this I do not mean that he should be able, or try, to act the part of a lawyer in drafting the contract or attempt to make decisions which call for special legal knowledge and training. It is desirable, however, that he understand some of the fundamental legal principles underlying the contract, and that he keep in touch, so far as may be practical, with decisions affecting the forms and interpretations of the contract. For this reason it will be my purpose from time to time to refer especially to legal cases dealing with the interpretation and operation of the agreement between owner and contractor, in addition to dealing with problems arising primarily between architect and owner.

In a comparatively recent case, decided in California—Monson v. Fischer, 5 Pacific (Second Series) 628—a decision has been handed down which is of interest not only because of its discussion and interpretation of various contract provisions, but also because of its special reference to the interpretation of a contract in which a printed form is used and supplemented with typewritten additions. This last phase of the decision is worthy of note because of the increasing use of printed forms of contract, such as the standard forms of the American Institute of Architects.

In the case referred to, a printed form of construction contract was used, but special specifications prepared by the parties were annexed to it and so made part of the contract. The printed portion of the contract provided that all differences between the parties should be decided by arbitration. The typewritten specifications, on the other hand, provided among other things that:

"To prevent all disputes and litigation the architect shall in all cases determine the amount and the quality of the several kinds of work which are to be paid for under this contract; and he shall determine all questions in relation to said work and the construction thereof; and he shall in all cases decide every question which may arise relative to the execution of this contract on the part of the contractor; and his estimate and decision shall be final and conclusive."

While the work was in progress, the architect certified that certain concrete was defective and that it did not conform to the standard fixed by the contract. He ordered the contractors to replace it with concrete conforming to the specifications. The contractors claimed that the concrete which they had furnished did conform to the specifications and demanded that the issue be left to arbitration. They appointed an arbitrator, but the owner failed to do likewise. The arbitrator appointed by the contractors then found that the concrete was not defective. The owner gave the required five days' notice of termination of the contract; and the contractors commenced suit on the theory that the contract had been improperly breached and terminated by the owner.

The court held (relying on this point largely, however, on a special California statute) that the typewritten specifications—which provided that the architect's decision should be final—controlled the printed portion of the construction contract providing for arbitration of any differences and that, in the absence of proof of some fraud or mistake (which was not shown in this case), the contractors were obligated first to obey the architect's decision and demand with respect to the concrete and to arbitrate afterwards. The court held further that since the contractors had wrongfully refused to remove the concrete on the architect's order, the owner was justified, on notice, in terminating the contract and was entitled to complete it, charge the expense of so doing to the contractors and withhold further payments until the completion of the work. Action by the contractors, therefore, was held to be prematurely brought and could not be sustained. The court said:

"The rule appears to be well settled that the decision, estimate, or certificate of an architect in approving or disapproving the work as a performance of the contract, or in passing upon questions relating thereto, is, in the absence of fraud, bad faith, or mistake, conclusive and binding on the parties where the contract either expressly or impliedly shows that it was the intention that the person to whom the question is submitted should be the final arbiter thereof."

The foregoing decision does not challenge the right of contractors to have the correctness of an architect's decision determined by arbitration. It does mean, however, that under the circumstances of this case and the wording of the contract the architect's decision in the first instance was final and conclusive. The course which the contractors should have followed was first to remove the work and proceed according to the architect's directions and then to test—by arbitration—the correctness of the architect's decision and their rights to damages, in the event that the decision had been unfair or erroneous.

In the use of printed forms of contract, the additions of typewritten riders and special provisions is a natural and common practice. This California case emphasizes again the importance of making sure that any special provisions typed on or otherwise added to such a printed form are carefully considered with reference to the provisions of the printed form and are so phrased as to avoid inconsistencies and to provide a complete contract form free from conflicting provisions. The presence in a contract of inconsistent provisions always invites trouble and misunderstanding. It is to the interest of architect, owner and contractor alike that the possibilities of such misunderstandings be reduced to a minimum. This can best be done in the beginning and by the exercise of a little extra care and thought in the preparation of the contract covering the work.

It will be noted that the contract in this case gives to the architect a far broader power to determine disputed questions than the ordinary contract gives to him. The tendency ordinarily is to limit his decisions insofar as they are made final to the interpretation of the plans and specifications, question of design, and the like. The courts have always recognized, however, the validity of provisions giving the architect greater powers and also the rights of parties by agreement to appoint him arbitrator with sweeping powers if they wish to do so. In the present case the court recognized the usual rulings and the validity of a contract provision making the architect's decision conclusive.

On the other hand it applied the rule in favor of the contractor as well as of the owner by holding that—in the absence of fraud or mistake—the issuance of a certificate by the architect would prove conclusive as to the contractor's right to the progress payment called for, subject to the general provision that the payment should not constitute generally a final acceptance of the work done up to that date. Finally, the court held that under the California Law "mere failure to pay an instalment as it becomes due, unless such payment is a condition precedent under the contract, . . ." will not "authorize a contractor to abandon the work and sue for all the benefits he would have received from full performance; but it nevertheless constitutes a breach which will justify a rescission and recovery for the work already done. . . ." In conclusion the court said:

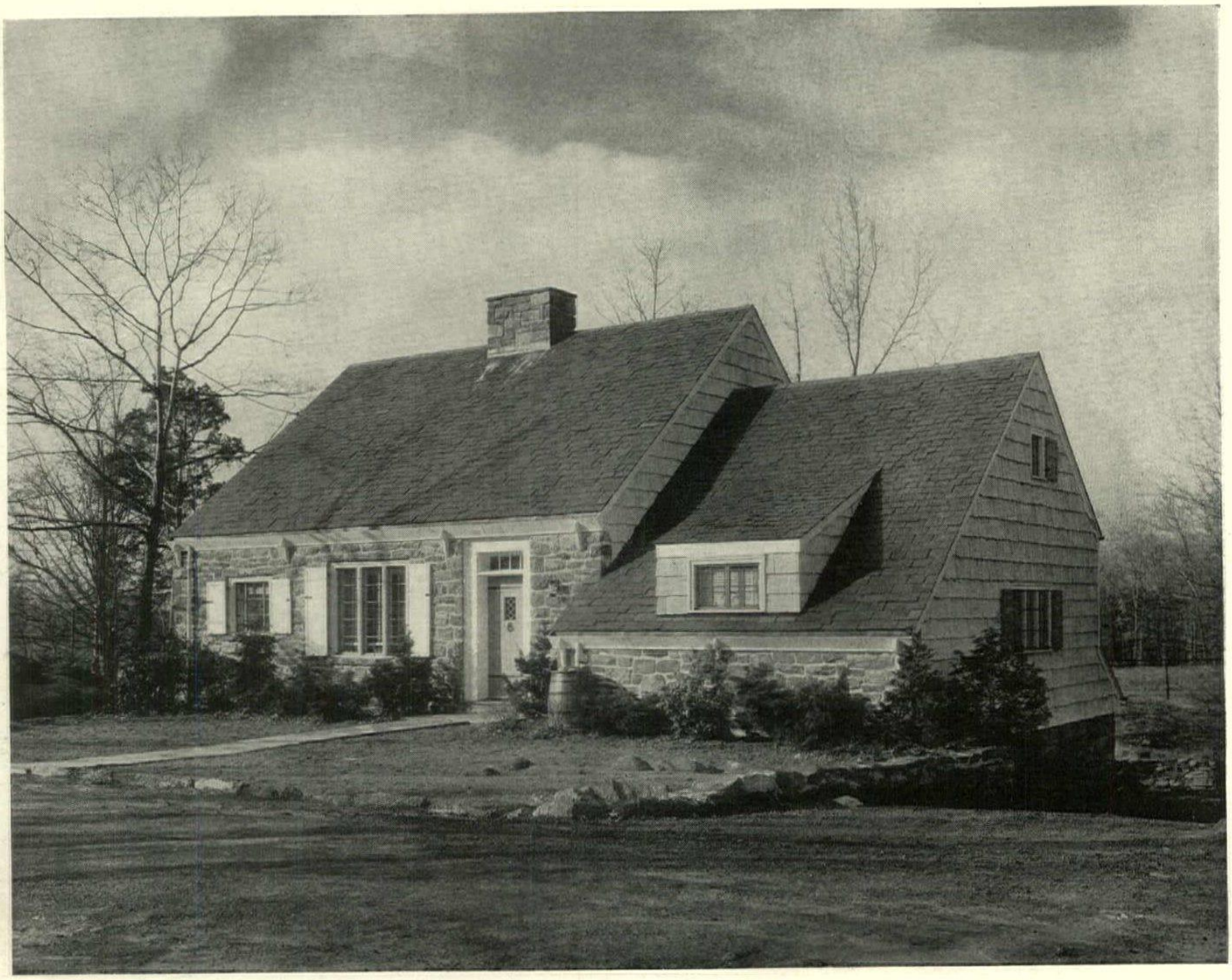
"We are of the opinion that under the contract and the evidence the contractors would have been entitled to recover the progress payment according to the certificate; but that such recovery or payment of the amount would not have constituted an absolute acceptance by appellant of the work done up to that time. They having, however, breached the contract by failing to remove the work objected to by the architect, and having persisted in such refusal, appellant was entitled after notice, which was given, to take possession and finish the work. This step having been taken, the contractors, as was expressly stipulated, were not entitled to receive any payment before the work was finished, and then only subject to the further rights of appellant under the contract."

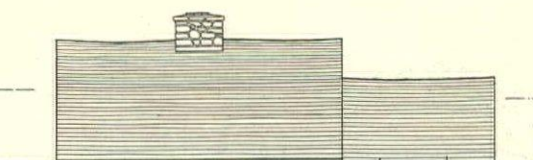
"BREEZY AFTERNOON," a pen-and-ink sketch by Carl W. Heilborn

C. C. MERRITT AND
URBAIN G. TURCOT, ARCHITECTS

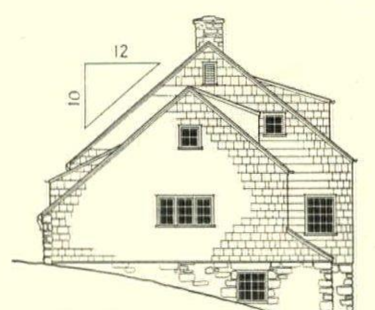
HOUSE OF ROBERT L. LOEB, LARCHMONT, N. Y.

Photographs by Harold Haliday Costain





8'-0"
9'-0"
7'-6"
8'-6"



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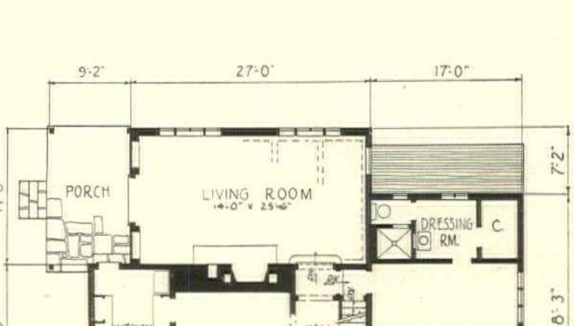
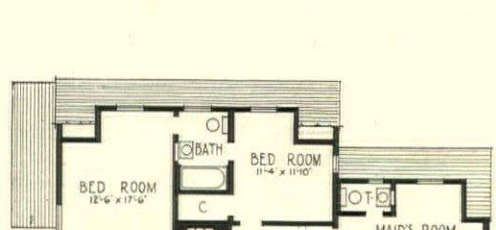
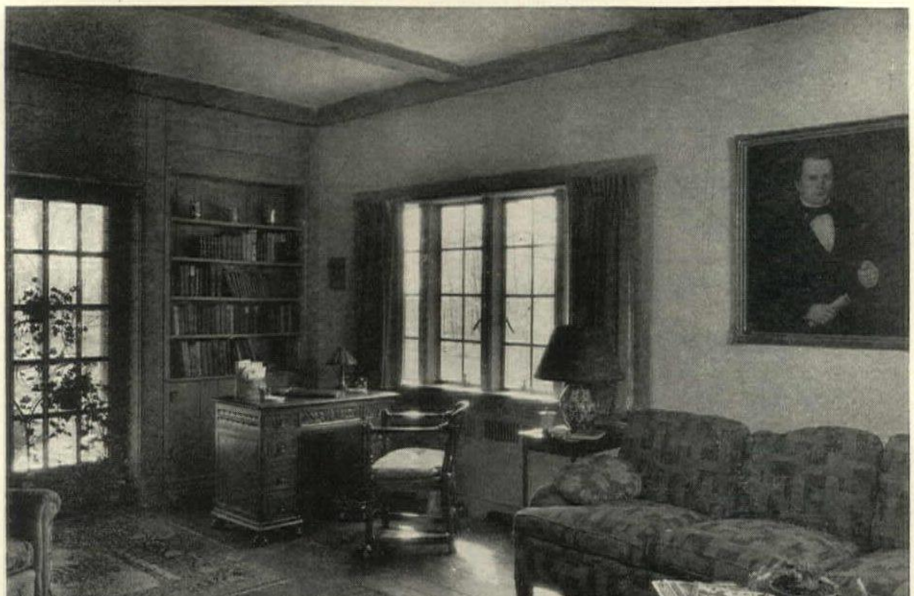
10



9'-2"
27'-0"
17'-0"
14'-8"
15'-6"
7'-2"
38'-3"
PORCH
LIVING ROOM
14'-0" x 25'-6"
DRESSING RM.
C.
KITCHEN
8'-6" x 14
DINING ROOM
12' x 13'
HALL
C.
MASTER BED ROOM
16'-6" x 16'-6"
31'-5"
17'-1"



BED ROOM
12'-6" x 17'-6"
BATH
C
BED ROOM
11'-4" x 11'-10"
HALL
C
C
STORAGE
L.C.
C
MAID'S ROOM
11'-6" x 16'



Two views of living room. Cubic contents of house, 32,500 cu. ft. Cost, 1933, 32 cents per cu. ft.

HOUSE OF ROBERT L. LOEB
LARCHMONT, N. Y.
C. C. MERRITT AND URBAIN
G. TURCOT, ARCHITECTS

How Architecture Can Be Sold

BY HERBERT J. MANN

Consulting Architect

Architects Exhibit, Inc., Los Angeles, Calif.

CURTIS-BILTMORE STUDIOS

WITH over two years of successful operation to its credit, The Architects' Exhibit and Advisory Bureau of Los Angeles has definitely passed beyond the stage of experiment. The organization has demonstrated that it constitutes one answer to the architectural problem of a successful small house practice. Interest in it and its accomplishments has been so keen that already plans have been formulated for expanding Architects' Exhibit, Inc., to a California-wide institution. The possibilities of a similar organization of national scope have soberly been visioned; and plans for its physical formation are already well under way.

The operation of Architects' Exhibit and Advisory Bureau of Los Angeles was described in detail in the May, 1933 issue of AMERICAN ARCHITECT. The structure of the organization is based upon the belief that:

First: The small house field offers an immense and fertile opportunity for architects.

Second: The small house owner can afford to pay for full architectural service.

Third: The American public will patronize an exhibition of good small house design. Its interest in a home of its own is vital.

Fourth: Such an exhibition is an excellent medium for bringing the prospective small house builder in professional contact with architects competent in the special field of small house design.

Every part of this conviction has been substantiated to such a great degree that it seems necessary to give the entire architectural profession the benefit of an experience unique in the small house field.

It is necessary first to outline some of the previous attempts to secure the tremendous small home market for the architect. Any such attempt, in my opinion, must devote itself to the accomplishment of three major objectives: First, improvement of architectural service so it is of real value to the small home builder; second, establishment of a conviction in the public's mind that services of a competent architect are essential to any building project; and third, revised methods to make the designing of small projects profitable to the architect. Failure to recognize these objectives may be responsible for the non-success of such movements as the Architects Small House Service Bureau, established in 1921, Better Homes in America, established 1922, The President's Conference on Home Building and Home Ownership, inaugurated in 1931, and the Chicago Architects' Guild of Small Home Design, 1933.

To say merely that these movements are contradictory is to be charitable. In one case, the necessity of employing an architect is minimized by offering the public stock plans which primarily eliminate the need of an architect's services. In another, the appeal used to foster the worth of architectural services is an attempt to make architects out of laymen. These various movements, while laudable in purpose, have scant assurance of success, since their very design reveals that their sponsors apparently are not convinced of the profitable opportunities in the small residence field.

Any plan which proposes to develop the architect's possibilities in the small house field must be predicated on two things: First, a recognition that the field itself is teeming with architectural opportunities, profitable from every standpoint; and second, a clear-cut understanding of how the problems that are to be met can best be solved.

The first should be obvious to any intelligent observer. The second can only be developed from a realization that the architect most competent to pro-

To The Small House Buyer . . .

THE CONTRACTOR ASKS, "Why not save the architect's commission? We will furnish plans!" The uninitiated home-builder queries, "If plans for a ten thousand dollar house can be had for fifteen dollars, why should plans for a fifty thousand dollar house cost more than seventy-five dollars?"

A PRACTICAL ANSWER to these questions is one of the most important contributions any individual could make to advance the profession of architecture. Herbert J. Mann has found this answer; and in doing so has lighted a guiding beacon for architects everywhere. He has proved that services of architects are essential to the production of honestly-built houses. He has shown that the public will pay a fair price for these services. He has removed a fear of architects based on allegations of extravagance, incompetency and weakness. He is instilling into the minds of prospective home-builders the essential of architectural propriety. And finally, he has pointed the way to professional employment for young men who cannot now hope for experience in prominent architectural offices.

HERBERT J. MANN is well fitted for the job he has undertaken. Graduating from the Massachusetts Institute of Technology thirty years ago, he gained practical experience in Chicago for a number of years, then went to Arizona, practicing as an architect and a consulting engineer. Next he practiced architecture in La Jolla, California. As President of the San Diego and Imperial County Society of Architects, as a director in the State Association of California Architects and as Secretary of the City Planning Commission of San Diego his gift of leadership manifested itself. Three years ago that same gift, reinforced by great enthusiasm and untiring energy prompted him to embark on this venture of holding up the beacon light.—WILLIAM H. SCHUCHARDT, F.A.I.A.

duce well-designed and compactly planned small houses is—in most instances—not a clever merchandiser of his product, which in this case consists of his technical skill and artistic abilities. Most of the attempts made to assist the architect in the small house field have taken no notice of this fact, nor have they included any method by which the skill and knowledge of the individual architect might be sold to a potential clientele.

This, primarily, is the function of the Architects' Exhibit and Advisory Bureau. This organization's success thus far has been due almost entirely to the business-like methods through which the public has been informed of the value, extent and costs of an architect's services.

Too much emphasis cannot be placed upon the manner in which this has been accomplished. The Bureau maintains a staff of salaried experts, part of which is engaged in administration of the Exhibit. Another group collects all manner of information contributed by cooperating architects, contractors, realtors, etc. From this practical research has been built up a clearing house of building information that is invaluable and unique in architectural annals. The worth of filed information of this type assembled in a systematic, business-like way, is demonstrated every day. Previous efforts, however, have shown conclusively that voluntary and unpaid research work is usually a flat failure.

These two services of the organization—exhibition of house designs and availability of building information—are only part of the complete work of bringing architect and client together toward the production of a small house. Other activities include the assistance of the client in buying a lot suitable to the type of house he desires, information regarding financing methods and costs and, of course, execution of the business arrangements between architect and client for the design, supervision and construction of small houses.

Let it be emphasized here that Architects' Exhibit and Advisory Bureau is in no sense a plan bureau. It performs no technical architectural functions. Primarily it is a service for architects, supported solely by pro-rated contributions from architects who take advantage of its facilities—exhibition rooms, publicity and the organization's clerical staff. Members of the staff act as small house salesmen and clients secured through the facilities of the organization are treated as individual clients by the individual architect of their choice. Every architect who exhibits is required to subscribe to the A. I. A. code of ethics. His qualifications are carefully examined before he is permitted to participate in the Bureau's program of contact and publicity. A hanging committee of the Bureau passes on all work submitted for the exhibit.

Regarding publicity, the Bureau has rather definite ideas. It recognizes the advantages of a well-directed and sustained publicity program, but feels that much of the publicity which architects have received in the past has been misdirected and in many cases actually injurious to the best interests of the profession. For example, a widely accepted prac-

Here is proof that the public will pay full fees for architectural service on small houses. This house, built under sponsorship of Architects Exhibit, Inc., is proof also that architects can capably design houses under $10,000. It was built in Los Angeles, California, in 1933 and cost $6,000, including an architectural fee of 10 per cent. Harold O. Sexsmith was the architect

tice of publishing house plans has recently been discontinued so far as the Bureau is concerned. We feel this has been extremely harmful to the architectural profession. Experience has taught us that the public takes these freely published plans to the builder, secure in the belief that they represent all the worth of an architect's service.

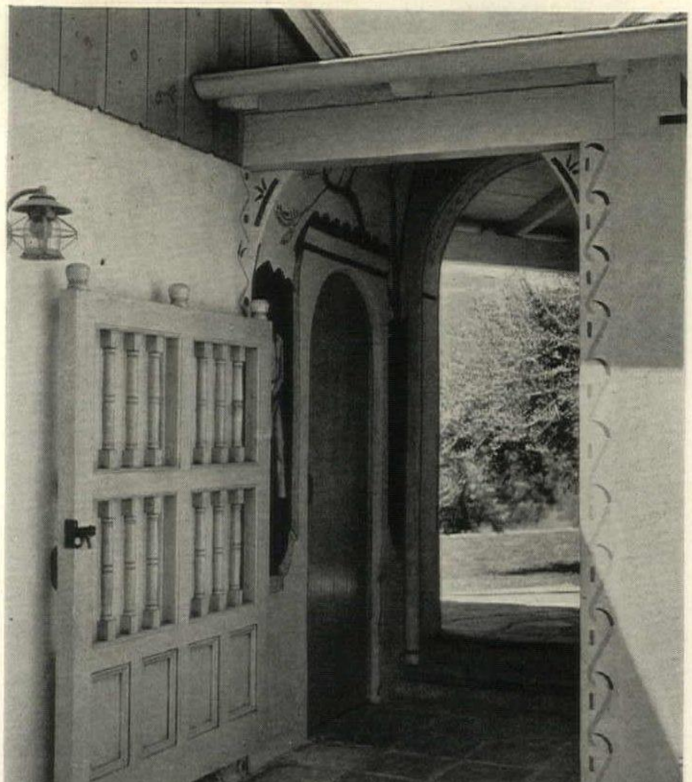
Altruism is, of course, a very worth while thing. But I do not know of another single instance wherein an industry makes the fruit of its time and effort available without charge. If architecture provides a legitimate service, it is certainly entitled to a fair return. We assume that it is and seriously recommend that architectural organizations everywhere stop nullifying their own efforts by random publication of floor plans.

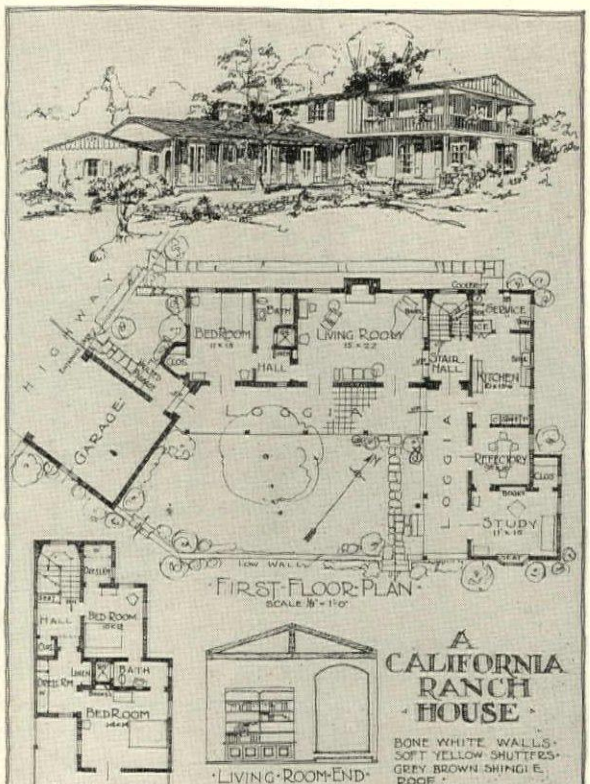
During the past two years more than 30,000 people have visited the Architects' Exhibit and Advisory Bureau; and at present the names of four hundred architects are in our files. All this has been accomplished without the benefit of a sustained publicity program. The experience of the Bureau has demonstrated conclusively that the following are substantial facts, not theories:

1. The small home builder is willing to pay an architect a fee of 10 to 15 per cent, provided first, that he thoroughly understands the nature of the architect's services; and second, that these services are so improved as to be really worth while.

2. A well-conducted exhibit will attract a thousand potential clients a month, thus saving the time and expense of seeking the small home builder.

ASSOCIATED PHOTOGRAPHERS





3. The bugaboo of overhead can be solved. The architect participating in an exhibit need not even maintain an office. He may meet his clients at the quarters of the organization and avail himself of its facilities for all purposes of an office except the drafting room.

The Architects' Exhibit and Advisory Bureau fills another long felt need. Although residential construction occupies a large percentage of the construction industry, the home builder has no source of unprejudiced information to assist him in the complicated process of building a home. The established agencies today are largely of a commercial nature and are by no means impartial centers for obtaining information. The Architects' Exhibit and Advisory Bureau is apparently the one place where the home builder may obtain unbiased professional advice on the numerous problems involved in the building of a home. He may command expert assistance in the selection of his building site. The records of architects are available for his inspection to assist him in making a competent selection. A clearing house of information on available building loans is maintained in order that he may select the one best suited to his needs. His questions on construction and materials are answered with no inducement to buy a particular product. Naturally, such an advisory bureau commands the utmost confidence of a home building public and has already built up an eager audience.

Three years of experiment have shown that Architects' Exhibit and Advisory Bureau constitutes a practical solution of the small house architect's manifold problem. From an equally important point of view the public reaps a benefit from improved design and better planned, more convenient homes. The construction industry is finding that employment of an architect insures better construction and discourages shoddiness and jerry-building even on the smallest of houses. The architectural profession as a whole is helped by the activities of the Bureau, because the public's misconception of architectural service is exposed and a better understanding of the architect's real value is engendered in the public mind.

The advantages derived from the Bureau are much too important to be confined to any one locality. Accordingly, an organization to make possible their national application is now being formed. It is called the Association for Advancement of Architecture. Though the maintenance of architectural advisory bureaus and exhibits will form a primary activity of the Association, many equally vital objectives are contemplated. These are:

1. To assist in preservation of natural scenic beauty by acquainting the public with the economy and advantages of good architecture; to encourage the remodelling of unsightly structures in accordance with sound architectural practice.

2. To promote the study of improved methods and design and to facilitate the more general use of good architectural design in residential construction.

3. To encourage improvement of home grounds and the business, factory and other areas through correct planning and planting, in accordance with principles of landscape architecture.

4. To encourage proper planning of towns, cities and regions.

5. To maintain architectural advisory bureaus and exhibits for the information of the public.

6. To stimulate more general use of paintings, sculptures and allied arts.

7. To work in cooperation with other organizations which contribute to the advancement of architecture or the cultural life of the community.

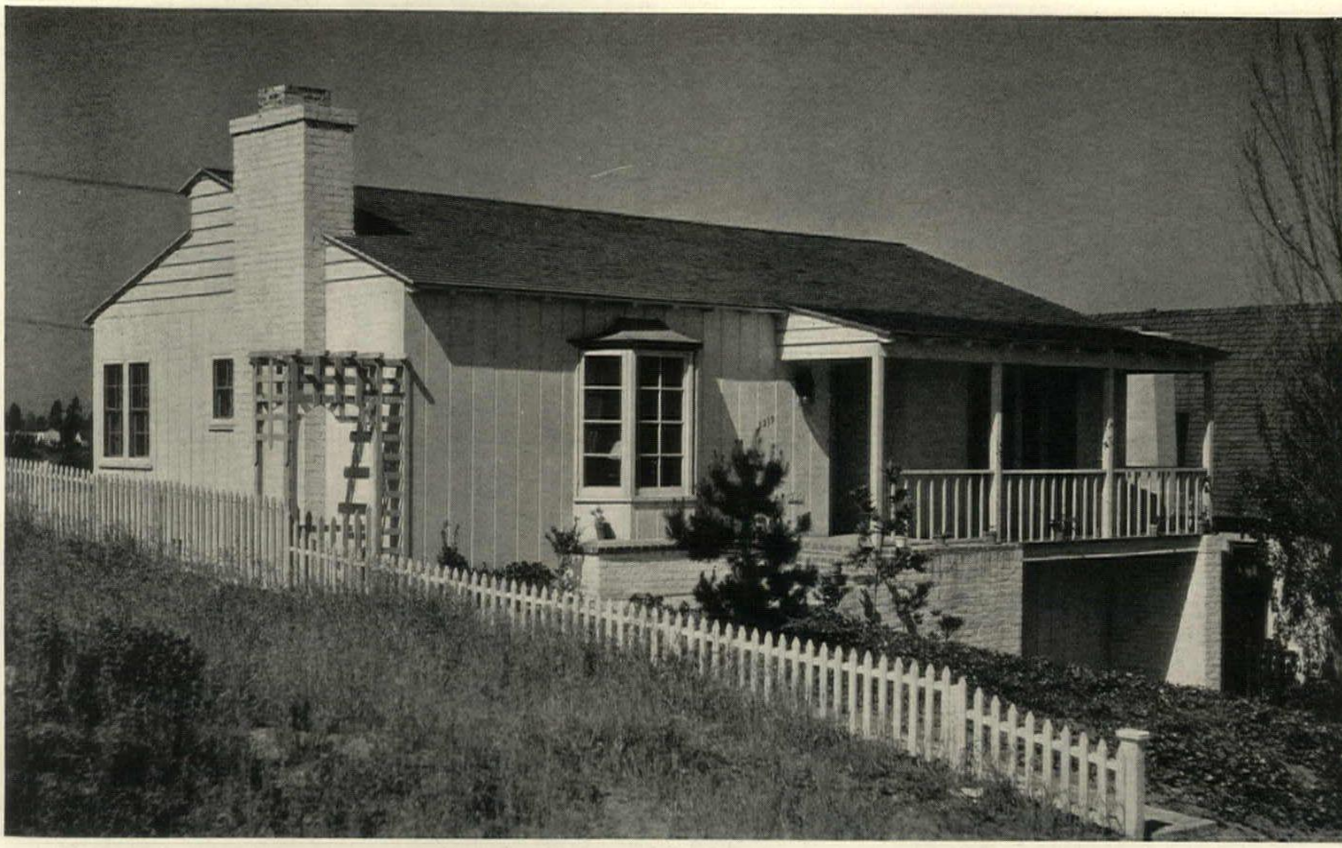
8. To encourage and assist in the preservation of historic structures.

9. To perform any other service which may be deemed appropriate in carrying out the purpose of this organization.

THE Association is administered by a Board of Trustees composed chiefly of prominent and public-spirited citizens and is supplemented by an Advisory Board, members of which include outstanding architects, educators, business and professional men. The organization is a non-profit institution; sustained by memberships which are available to the architectural profession, the various parts of the construction industry and the general public. Since the Association has been dedicated to the best service of these three groups, it is only logical that they be looked to for the support and maintenance of the project.

The Association for Advancement of Architecture as a national organization could wield a wide and powerful influence, effectively moulding public opinion and coordinating the direction of activities toward the accomplishment of its stated objectives. From the vantage point of a national outlook the Association could control a vigorous campaign of publicity and educational advertising. It could be an authoritative source for practical information on all phases of building activity; and its research staff could be made invaluable in the development of selling methods, forms of procedure, business campaigns and the like.

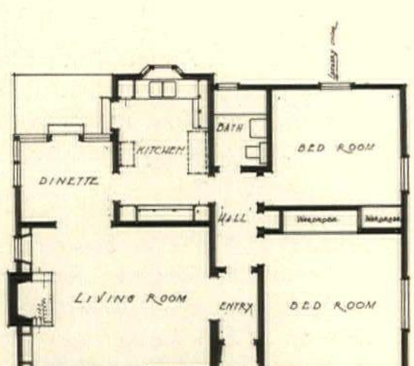
Of all the professions, that of architecture most needs the guiding initiative of such an organization. No one will deny the seriousness of the local architect's problems. But it is equally evident that they are only the reflection of those which today face the profession as a whole. Solution of them requires a unity of purpose and vigor of action that can only come from the authority of a central body. It is this authority which the Association for Advancement of Architecture can secure. For the public the Association can become a national clearing house of building ideas; and to every member of the architectural profession it can stand for economic opportunity, maintenance of professional integrity and elimination of unfair business practice.

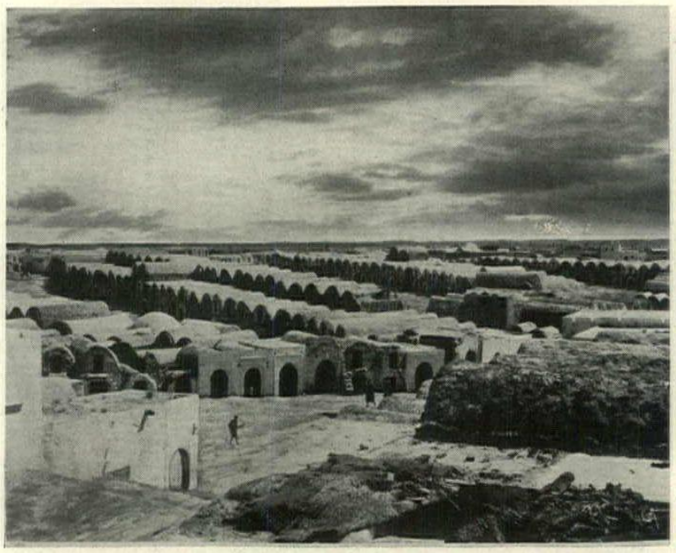


FRANK W. GREEN, ARCHITECT

HOUSE FOR MR. AND MRS. W. R. DOWNIE
LOS ANGELES, CALIFORNIA

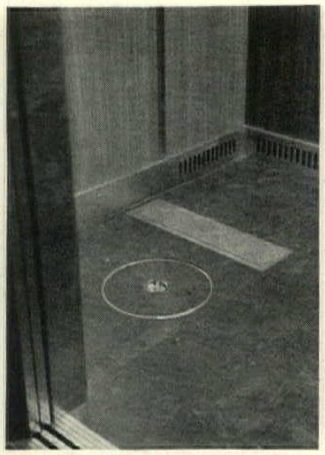
Photographs by Associated Photographers

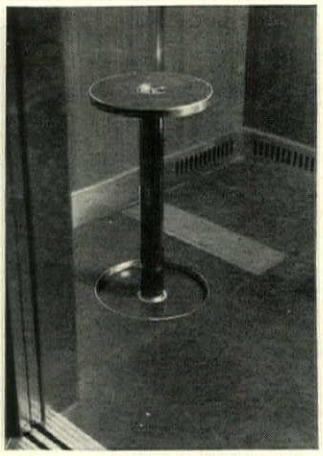




GALLOWAY

Here is proof that twentieth century America is not much removed from ancient Tunisia so far as housing conditions are concerned. Above, adobe dwellings of a Tunisian town built by troglodyte tribes. Below, Queens section of Long Island developed by speculative builders

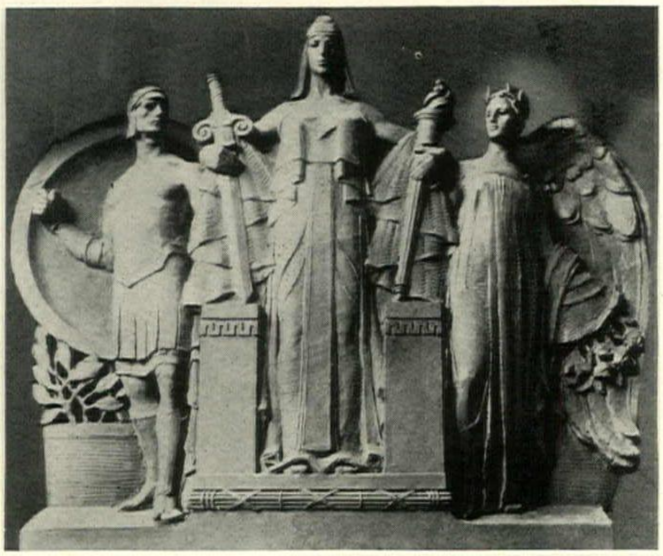




HEDRICH-BLESSING

Newest space-saving wrinkle for elevator cabs. This disappearing seat was developed by Otis engineers for tired operators of new elevators in Chicago's Tribune Tower. Below: Justice, guarded by Courage and Wisdom. This sculpture, by Frederick W. Allen, is part of the Department of Justice Building in Washington, D. C., Cass Gilbert, architect

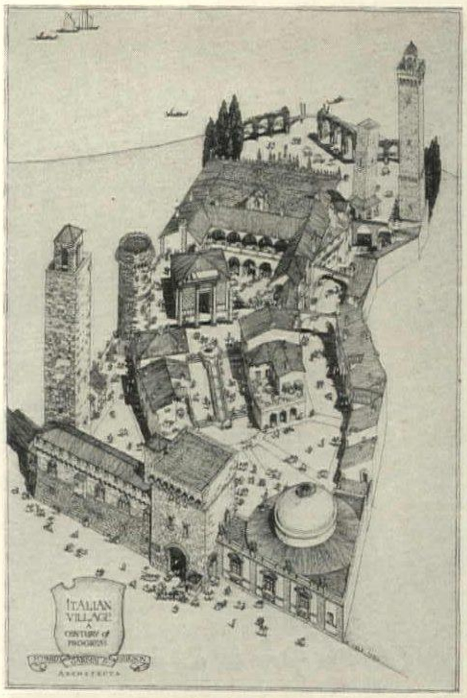
WIDE-WORLD

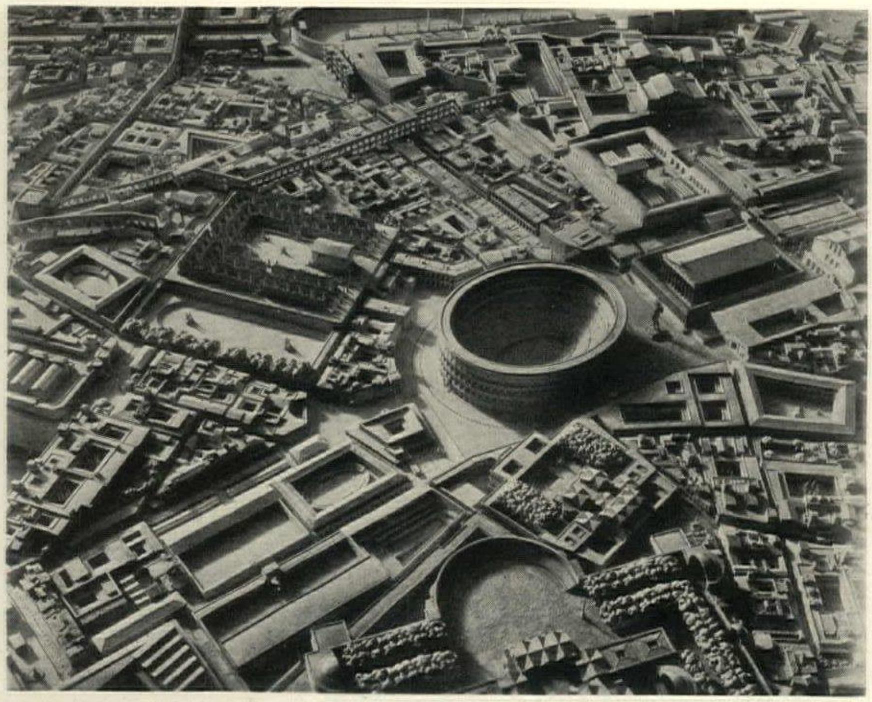


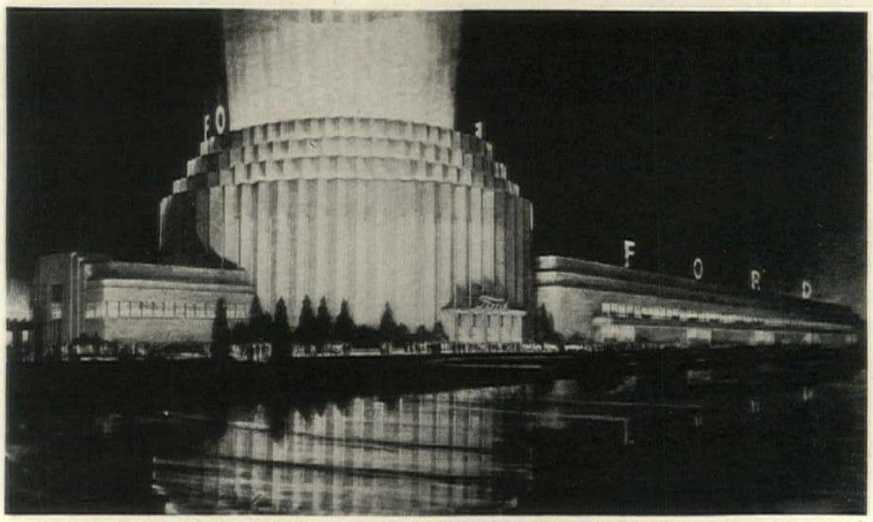
Trends and Topics

• Plans of the Administration to help an expenditure of one and one-half billion dollars for home repair and modernization may prove an effective priming for the dry pump of the building industry. As outlined, government insurance of bank and financial company loans would make available individual loans of $200 to $2,000 at 5 per cent with long-term, installment amortization. Actually the scheme is based on mobilization of existing credit resources rather than direct Federal appropriation. As first projected it was a part of a more comprehensive project of housing and slum clearance aid. Due to the immense sum needed to accomplish desired results, action in this field of building will be deferred until Congress meets again in the fall. It is probable that government aid will then be tendered in the form of mortgage rediscounting and loan insurance through formation of a mutual insurance mortgage insurance corporation under government supervision and direction. This would permit many an individual to start construction thus far deferred because of uncertain security in clogged financial channels (see AMERICAN ARCHITECT, page 9, September, 1933).

• The radio is a gadget of increasing educational importance in the American home. Recently, under the auspices of the American Federation of Arts and over a coast to coast network, a program about "Art in America" was initiated by the General Federation of Women's Clubs. A similar idea is worth







LUCIEN BEAUGERS

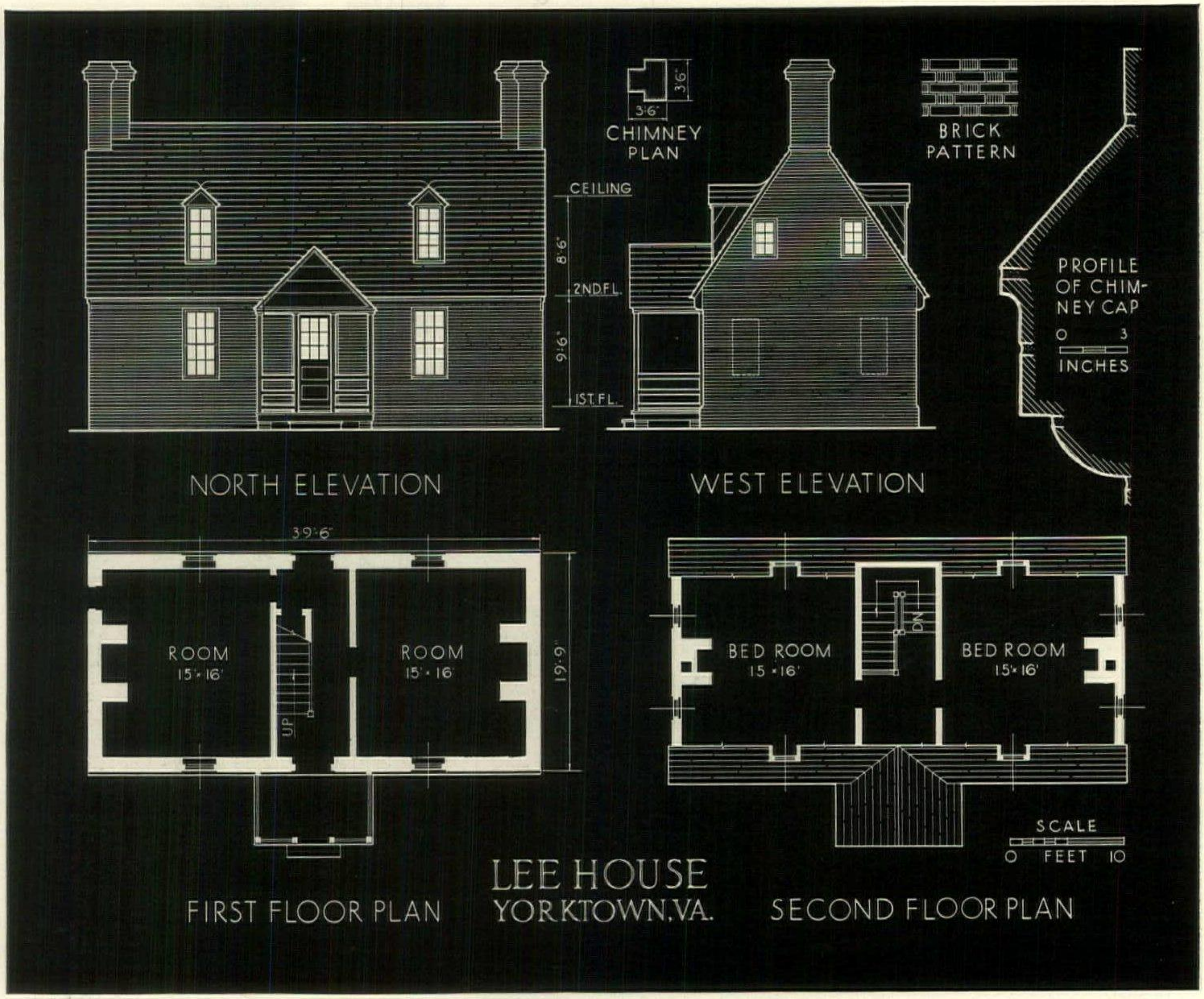
Every detail of ancient Rome has been restored in a plaster model by Paul Bigot, French architect. Executed to accurate scale, the model forms part of an exhibition in the Paris Institute of Art and Archaeology. Travelers will recognize Flavian's Coliseum and, at upper edge, the Circus Maximus. The Temple of Venus is at the right of the Coliseum; in the foreground are the Baths of Titus and Trajan. Upper left: Visitors to A Century of Progress may stroll this summer through a typical village of old Italy now being developed under direction of Schmidt, Garden & Erikson, Chicago architects. The pen-and-ink air view of the village was done by Vale Faro. Below it is a Ferris-like perspective of the Ford exhibition building, also a 1934 addition to A Century of Progress. Albert Kahn was the architect

of the Times . . .

considering from a standpoint of architectural design. It is too early yet to tabulate the results of the present program, since it will not be entirely completed until May 19th. But if they show that the average family is really interested in subjects of this type, a program on architecture and construction might prove profitable from a variety of angles.

• A new method of stimulating activity in the small house field may result from a cooperative building effort undertaken by a group in Middletown, Ohio, which includes an architect, a building supply dealer, a sub-division owner, a contractor, a steel man and an inventor of a new method of low cost home construction. A small suburban house, planned by Harold Goetz, architect, will be built under a system of simplified building construction invented by R. F. Berryman. Each member of the group will receive his pay after the house is sold. It is hoped that the scheme will eliminate pyramiding of profits and thus effect a substantial reduction in building costs. Results will be carefully studied; and the joint operation, if successful, may lead to a similar cooperative effort on a larger scale. Under the Berryman system of construction it is believed that attractive houses can be erected for as low as $1,000.

• Insuring the life of property is one of the latest suggestions for stabilizing values and raising the standards of building (*Continued on page* 134)



LEE HOUSE, NAVY MINE DEPOT, YORKTOWN, VA.

"CROKER" HOUSE, NEAR NORGE, VA.

MEASURED AND DRAWN BY LANDSCAPE DIVISION, YORKTOWN OFFICE
DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE

Drawings prepared for publication by Weston Morley Geety

The Lee House (Kis Kis Kiack) probably dates from the late 17th Century. The porch, dormers, windows, cornice and end boards as shown were taken from a photograph and measured drawings made by Addison F. Worthington before the fire of 1915 which destroyed everything except the brick walls and chimneys. The plans and brick coursing as shown were made from observations at the existing building. Modern front and rear porches and a modern wing attached to the east end of the house are not shown. The flat header arches on the end windows probably replace original segmental arches. Closers occurred on the east and west chimney faces, but not on the north and south faces


PLASTER
END ELEVATION
FRONT ELEVATION
7'-7"
10'-2"
SECTION
31'-4"
DN
DINING ROOM
11'-4" × 15'-4"
UP
26'-3"
LIVING ROOM
13'-5" × 15'-4"
HALL
9'-6" × 25'
FIRST FLOOR PLAN
SCALE
0 FEET 10
DN
BED ROOM
9'-0" × 15'-4"
BED ROOM
11'-0" × 15'-4"
HALL
9'-6" × 25'
SECOND FLOOR PLAN
BARGE BOARD
CORNICE
9"
SIDING
CORNER BOARD
WOOD
PLASTER
1'-8"
FIREPLACE
MANTEL
SCALE FOR PROFILES
0 1 INCHES 4 5
SCALE FOR FIREPLACE
0 1 FEET 3 4
"CROKER"
HOUSE NEAR NORGE, VA.

As It Looks

HONOR ARCHITECTS ON MEMORIAL DAY

IN 1932 Delos H. Smith, architect, Washington, D. C. while making a biographical study of early Federal architects found that Robert Mills was a more important architect one hundred years ago than history records. Mr. Smith found Mills' obscure and unmarked grave in the Congressional Cemetery. The Allied Architects, Inc. of Washington held a competition among unemployed draftsmen for the design of a suitable memorial to Robert Mills. The competition was won by Philip G. Golden. A bill was introduced in Congress in May 1933 to secure an appropriation of $5000 to build the monument.

This story is cited as an illustration of how prominent architects who have passed on can be honored by the profession. The honoring of deceased architects in some appropriate manner is something that all architectural organizations might well make a custom to be followed on Memorial Day. Architects in a few cities have been doing this for several years. It is fitting that the profession pause once a year to do honor to the memory of those who have contributed much to the advancement of architecture and the profession in the United States.

WORSE OFF THAN ARCHITECTS

THE International Blue-printers and Allied Industries Association claims that Government competition with private business is working a greater hardship on its members than it is on the profession of architecture. Government bureaus make their own blue-prints. Even when a private architect designs a Government building the blue-prints are made not locally but in the Government plant in Washington. This is not consistent with the idea of spreading employment among our citizens. The blue-printers have a just claim. Here's hoping something can be done about it.

DON'T LET THEM GO AWAY DISGRUNTLED

ONE'S impression of a business man is often formed by the impression conveyed by the acts of his subordinates. Many a man has been misunderstood because of a tactless girl or boy in the reception room. Granted that the time of a busy person must be safeguarded, there still remains no excuse for lack of courtesy toward anyone who calls. All too often persons in the reception room take it upon themselves to decide whether or not the caller shall see the "boss." It's a good idea to find out whether or not the girl in the front office knows how to handle callers with tact and courtesy. Some time she might turn away a potential client or a manufacturer's representative who knows where you can obtain a good commission for a new building. People dislike to tell their story twice. It should be necessary to tell it only to the boss. And courtesy in business pays good dividends!

IS IT TIME TO CHANGE?

SAMUEL CROWTHER interviewed A. W. Robertson and published, in *The Saturday Evening Post,* an article "Men or Machines." In it he stated, "Perhaps no industry is so vitally identified with growth and progress as the construction industry." He quoted statistics showing the economic importance of construction and mentioned changes in other industries and in the standards of living that have had important effects on the building industry. "No industry changes its methods just for the sake of change. The search for business forces the changes in order to get lower costs or better products," he said. Lower building costs and better buildings are among the important problems confronting the construction industry today. The architectural profession could make no more important contribution than to do some deep thinking that would lead to a solution of these two problems.

WATCH FOR FIRE HAZARDS

AMERICA'S fire loss for 1933 was more than $400,000,000. Even this huge figure is slightly less than the amount lost in 1932. In 33 states the chief cause of fire loss is listed as "strictly preventable" by the National Board of Fire Underwriters. In 15 states the known originating cause for the largest individual loss was defective chimneys and flues. In one state the loss attributed to faulty stoves, furnaces, boilers and pipes was nearly one and one-half millions of dollars. These figures contain a cue for architects. Pay particular attention on the job to the construction of chimneys and flues, to their thorough insulation against combustible materials and to the proper installation of all types of heating equipment. Failure to do this may result in hazards that may swell the staggering total of fire losses.

To the Editors

THE SAME OLD STORY

THE Federal Government is building a Subsistence Homestead at Readsville, Va. A proposal was made to build a furniture factory to give regular employment to these homesteaders. It was argued that this factory would make furniture for post offices and hence would not be in competition with private business. A howl went up; protests poured in; and Congress decided that this factory *would be* in competition with private business! The same lawmakers fail to see that the design of Government buildings by Government bureaus places the Government in competition with private business. How do these public officials reconcile this inconsistency? Architects deserve at least the same business consideration as that accorded furniture manufacturers. Or don't they?

AN ENGINEER TELLS ONE

ADDING to the tales of architects who plan buildings with no stairways, or no chimneys, or with chimneys that go up through the middle of rooms, here's one told by an engineer on his own profession. A man, who is today a well-known engineer, in his youthful days designed a bridge. One day the shop which was fabricating the steel received a hurry call from the field erecting force asking that the pins and rollers for the end of the bridge be rushed to the job. Investigation in the shop disclosed that the designer had completely forgotten to include pins or rollers in his plans! With a large field force being held up on company pay, the shop got the pins and rollers out to the field in a hurry!

WATCH HOW YOU WRITE IT

WERNER HEGEMANN, eminent German architect and city planner, in a talk before the members of the Architectural League of New York, threw on the screen a picture of the structural frame of a well-known building and compared it with the completed building. The envelope of the building showed absolutely no relation to the structural method employed behind it. Mr. Hegemann raised the question, "Is it the architect's function to cover up the facts or to express the facts and develop the record of our times?" Incidentally, much of what we know of the history of the past has been derived from the architecture of various periods. We ought to give more thought to the history of our times which we are writing in our architecture.

WHICH SHALL IT BE?

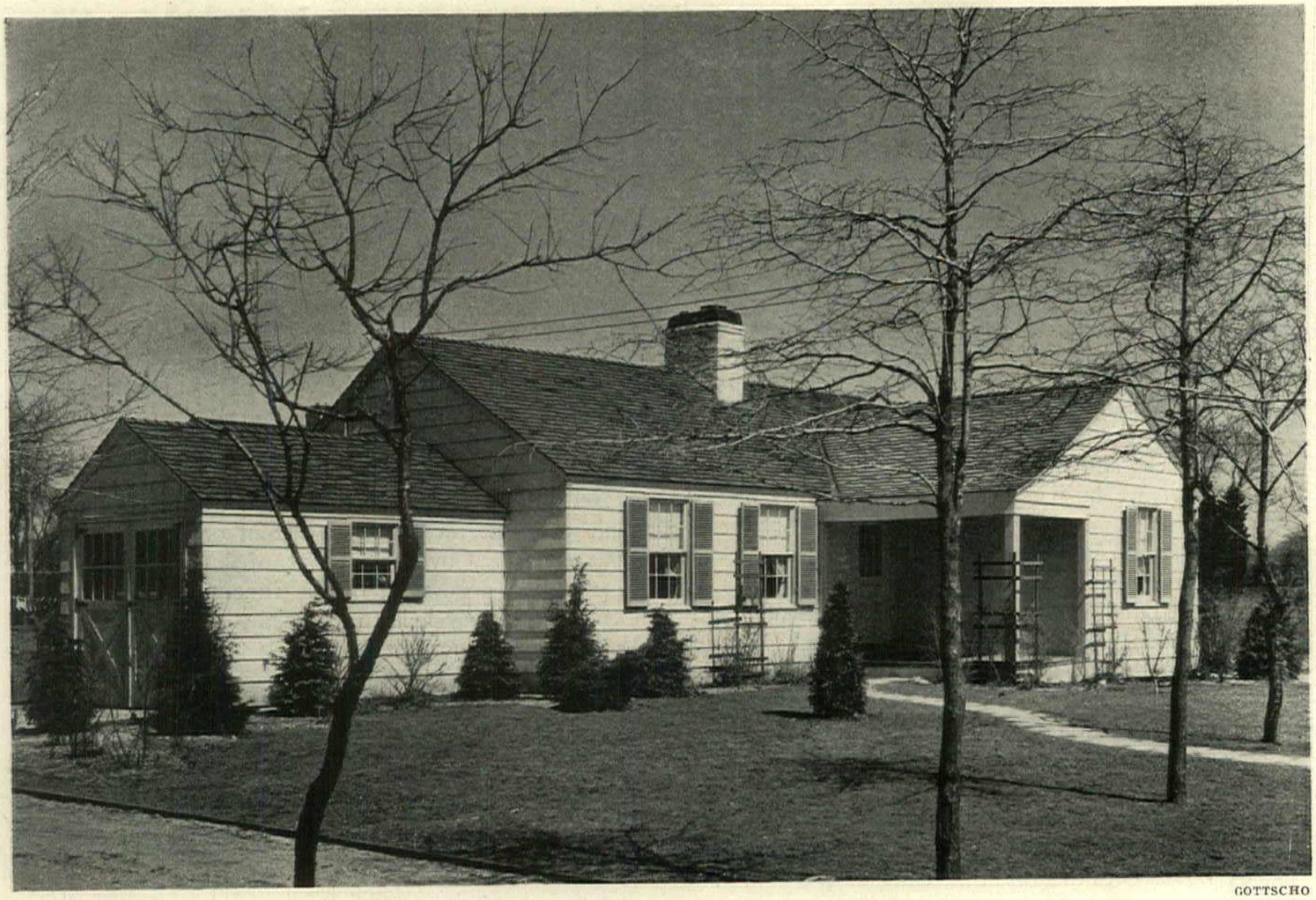
GOVERNMENT bureaus continue to grow larger and larger. New bureaus are formed to do this, that or the other. Plans to aid the unemployed spring up over night. And these usually mean another bureau. As these bureaus grow one is more and more convinced that the time fast approaches when we must decide whether or not we shall all work for the Government or whether we shall get the Government out of business. How easy it is to lose sight of the function of government! How easy it is to lose sight of the fact that WE are the government!

MR. HARMON WAS VERY MUCH THERE

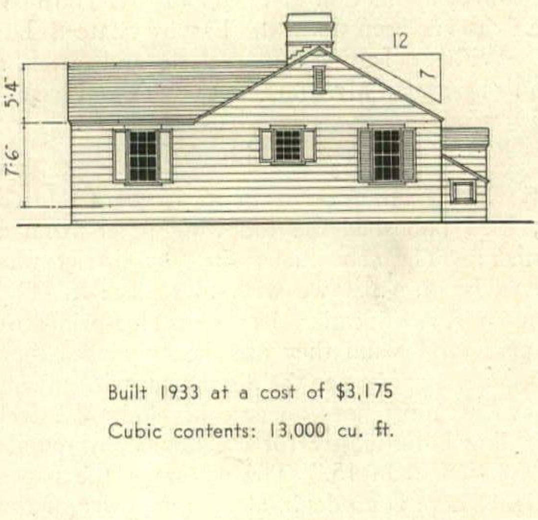
WHEN Col. L. Icre, Director of the French Steel Institute, visited the United States he was entertained at the Architectural League of New York. At dinner he sat next to Arthur Loomis Harmon, President of the League and a member of the firm of Shreve, Lamb & Harmon. During a lull in the conversation, Col. Icre said to Mr. Harmon, "Have you ever been up in the Empire State Building?" Without batting an eyelash and after a moment's hesitation Mr. Harmon said, "Yes, I have."

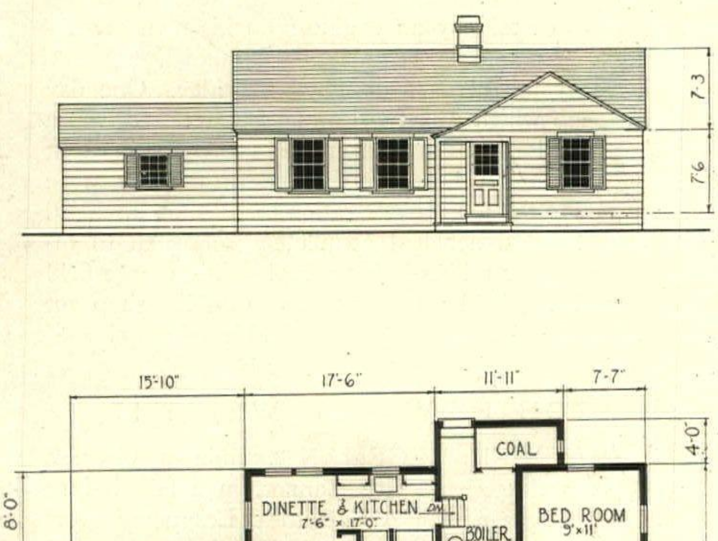
THE POWER OF THE STATE

THE Rural New Yorker in its issue of March 10, 1934 published the following letter from a subscriber: "The schoolhouse in our district was destroyed by fire and we wish to replace it. The Department of Education has sent blue-prints of some plans and claim they are the only ones they will approve, according to the district superintendent, who says we must have an acre of land. We feel the building is too costly for the number of pupils there are, less than 15." The editor of the paper replied: "There is no doubt about the power of the State authorities to compel a building according to their specifications. They may not if those concerned make sufficient protest, but they have the power to do so. The legislation giving them this arbitrary authority was worked through while those concerned did not realize just what was happening. . . ." On the face of the case maybe this was another piece of bad legislation. So long as we are not concerned with acts of our lawmakers, these laws will be passed. An architect could have given this community a school which, in size and cost, would have met its needs. Another case of Government in business!



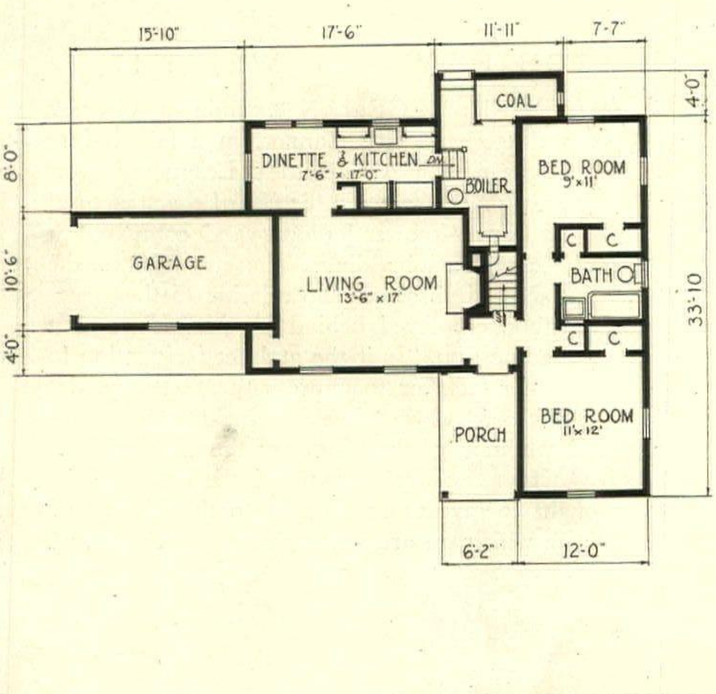
GOTTSCHO





Built 1933 at a cost of $3,175

Cubic contents: 13,000 cu. ft.

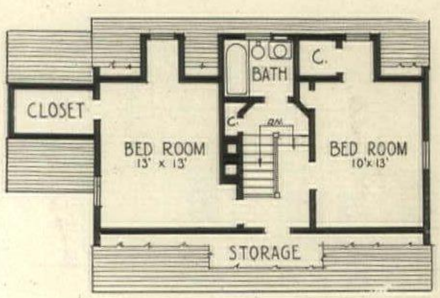


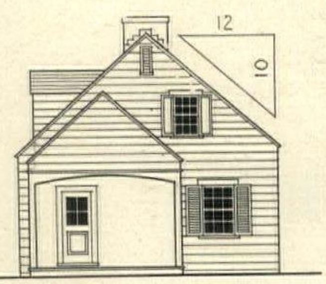
RANDOLPH EVANS, ARCHITECT

HOUSE OF HAROLD S. EMERY

HARBOUR GREEN, LONG ISLAND, N. Y.

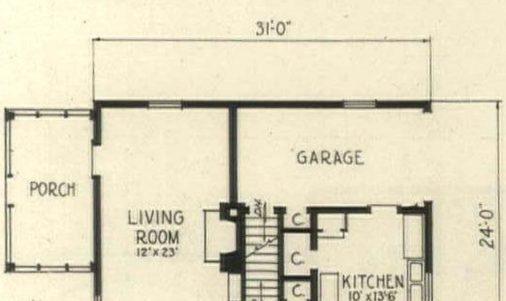
GOTTSCHO

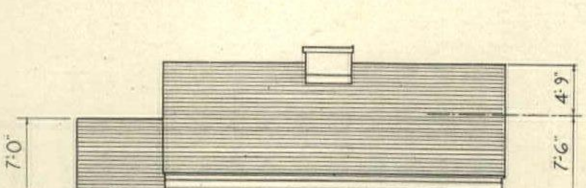




Built 1931 at a cost of $4,100

Cubic contents: 13,000 cu. ft.

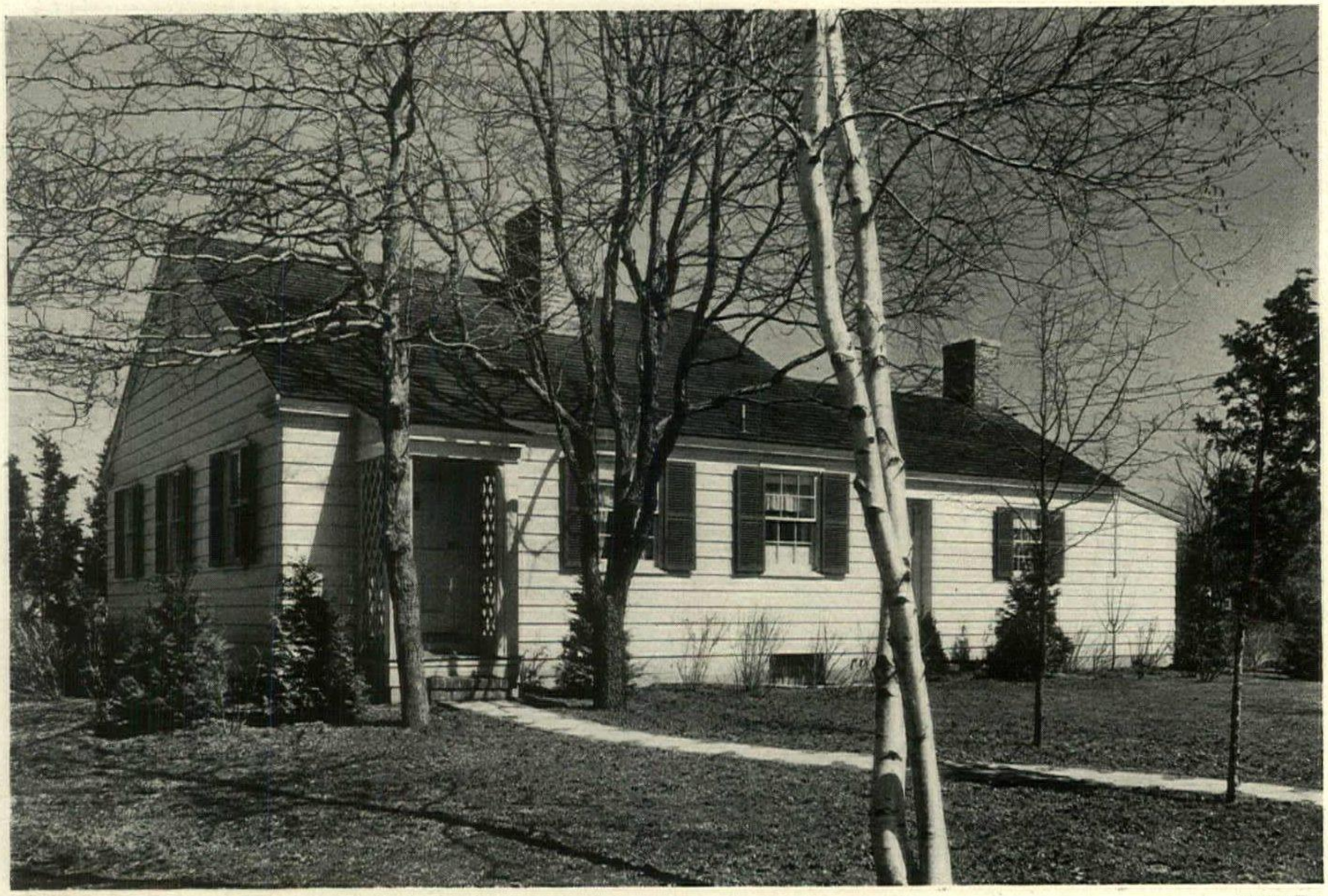




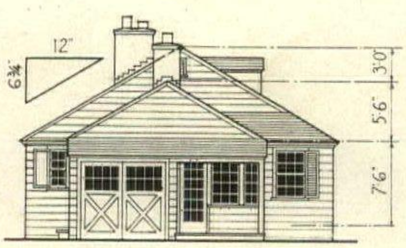
RANDOLPH EVANS, ARCHITECT

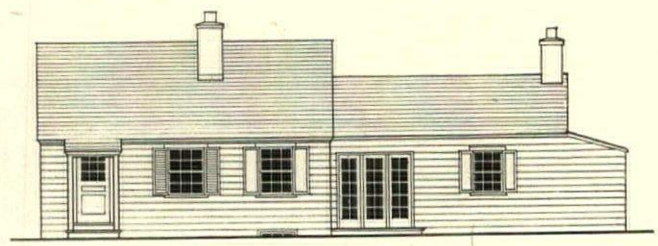
HOUSE OF GEORGE R. PEARSON

MASSAPEQUA, LONG ISLAND, N. Y.

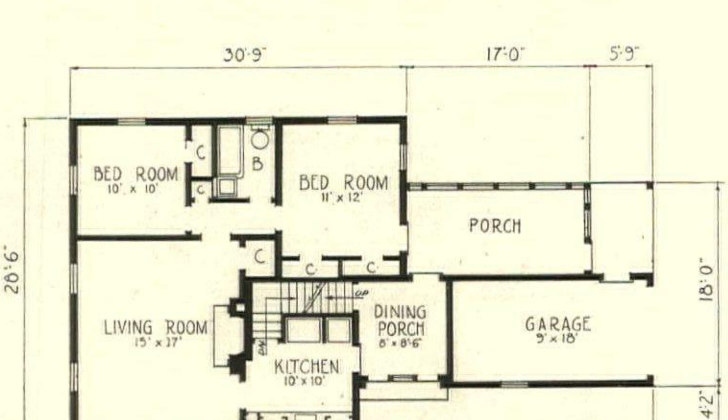


GOTTSCHO





Built 1933 at a cost of $3,886.
Cubic contents: 13,100 cu. ft.



RANDOLPH EVANS, ARCHITECT

HOUSE OF MRS. VALESKA TESKE

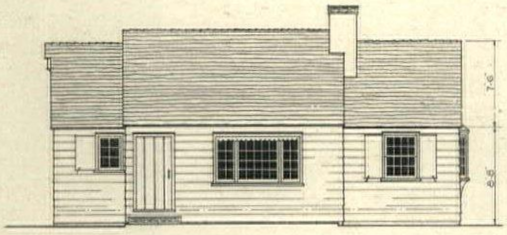
HARBOUR GREEN, LONG ISLAND, N. Y.

ALLAN McDOWELL, DESIGNER

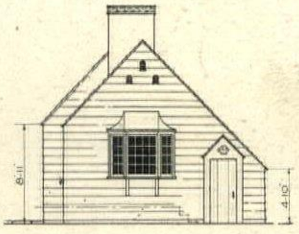
HOUSE OF MISS HELEN R. BULL
KENT, CONNECTICUT

Photographs by George Van Anda

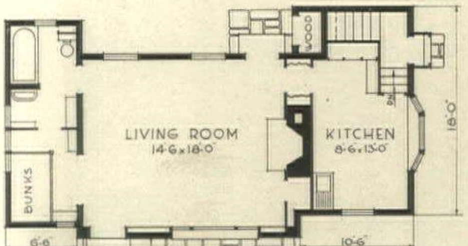
Construction notes: Walls, shingles, stained white; roof, shingles, stained gray; shutters, blue; chimney, red brick with cast concrete cap. Roof of bay, lead with cut out design on edge. Interior walls, 10" and 12" vertical pine boards; ceilings, pine with batten strip; living room and bunk room painted ivory; kitchen, blue; bathroom, coral and ivory. Floors, wide pine boards, blind and surface nailed, painted maroon. Hardware, hand wrought iron. Cost, including grading, dirt road, planting, and retaining wall, $2480. 6,888 cubic feet. Built in 1933



FRONT ELEVATION



RIGHT SIDE



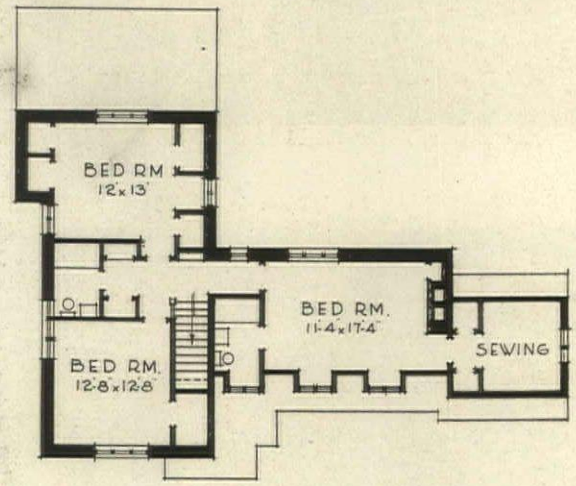
PLAN

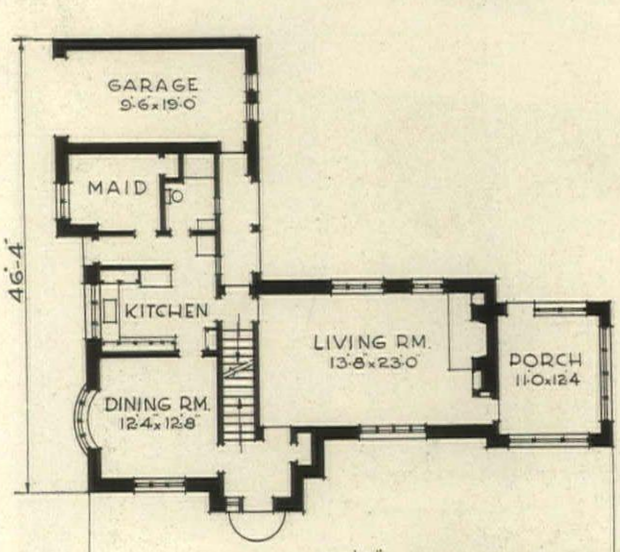
REAR ELEVATION

LEFT SIDE

HOUSE OF MISS HELEN R. BULL, KENT, CONNECTICUT, ALLAN McDOWELL, DESIGNER

HOUSE OF MISS HELEN R. BULL
KENT, CONNECTICUT
ALLAN McDOWELL, DESIGNER



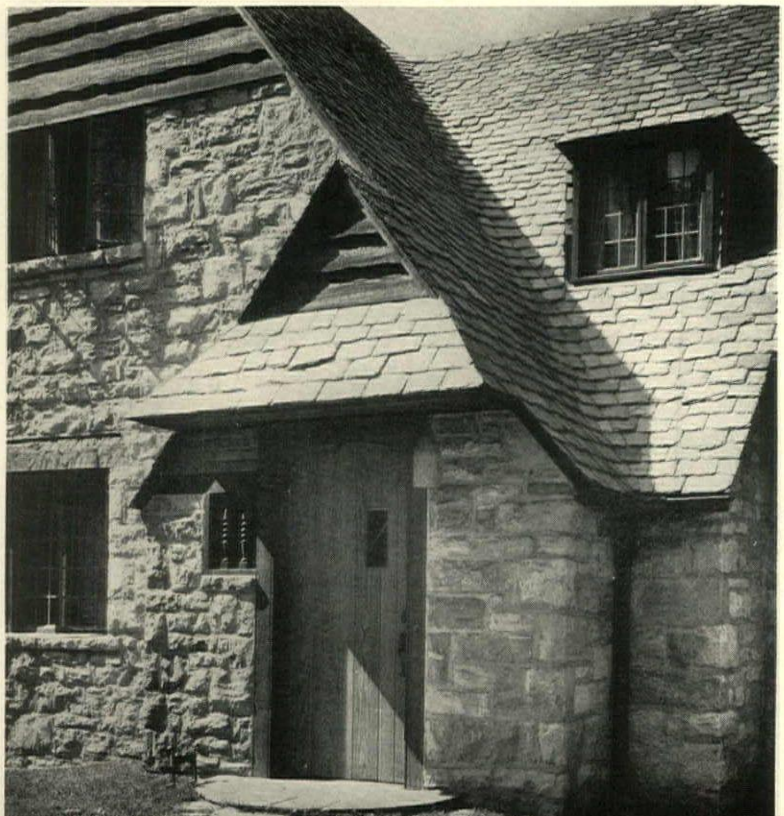


Exterior walls, local limestone ranging in color from cold to warm buff gray. Vertical stone joints filled flush with mortar and surface brushed with a gunny sack. Interior walls, dull ivory, palm-finished plaster. Ceilings, exposed timbers, rough sawn ceiling boards. Floors, oak, random widths. Fireplace facing, common Holland brick. Trim, wormy chestnut. Window sills, kiln run floor tile. 34,500 cubic feet. Cost 53.5 cents per cu. ft. Built 1930

J. B. HILLS, ARCHITECT

HOUSE OF J. B. HILLS
WEBESTER GROVES, MO.

Photographs by Alexander Piaget



LIVING ROOM AND EXTERIOR DETAIL HOUSE OF J. B. HILLS WEBESTER GROVES, MO. J. B. HILLS, ARCHITECT

The Future of Small House Financing

BY MORTON BODFISH

Executive Vice President, United States Building & Loan League

MANY of us are asking today what will be the source of money for future home-owning transactions. Barring a comparatively small percentage of the total home mortgage debt of the country which is being transferred to a kind of relief category in the care of the Home Owners' Loan Corporation, we will continue to look for our home mortgage capital in the savings of the 50,000,000 who have jobs in normal times. That is fundamental. In a sense we are having a new deal in home financing, but it is a matter of method, of better organization, of coordinated lending agencies rather than a revolutionary transposition from a tried and true method to experimental lending by inexperienced lenders.

We are not trying to establish a spotless bill of health for home financing of the past. There were two painful maladies aggravating the situation a little more keenly in '32 than in '31 and still more grievously in 1933 than in the other years. One was the continual curtailment of the funds invested in home financing institutions. The other was the exposure of unsound financing methods used by half of the residential money lenders in the prosperous '20s. Writing only last month Chairman John H. Fahey of the Federal Home Loan Bank Board made the statement that the complete abandonment of the short-term, supposedly renewable home loan of straight three to five year maturity, would be necessary in order to establish in America lasting strength and stability in the home financing structure. From now on our home lending—if the Federal Home Loan Bank Board has anything to say about it—is going to be long-term, monthly repayment of a type similar to the old-fashioned building and loan mortgage.

Since 1932 the Federal Government has been taking steps to remedy the ills of home financing. In succession two permanent institutions have been created to ease the way for the long-term loan; and one relief organization has been set up to put distressed mortgages on the practical long-term monthly repayment basis. At the time of this writing the Senate of the United States and the House Banking and Currency Committee have given approval to a further home financing measure to increase the efficacy of the institutions already formed.

In a single piece of legislation, the Home Owners' Loan Corporation for the relief of distressed mortgages and the Federal savings and loan associations—both permanent institutions in thousands of localities—were authorized. Federal savings and loan associations have already been chartered in 214 localities and are now working to supply local long-term credit to home owners in communities which up to now have not had such facilities. The Federal Government has appropriated $100,000,000 for investment in their shares. It is hoped that every community in America with enough local capital to support one will have its own home lending institution in a few years.

Thus it appears that for the first time we now have adequate machinery to supply the home owner with the practical kind of mortgage money which he has been needing all these years.

Miracles cannot be expected of this new machinery. Let us recall that we are depending upon the savings of the people to rebuild the home mortgage capital structure. A billion dollars of those savings cannot be commandeered overnight. We do know, however, that over a period of months and years this saving on the part of the ordinary people has made possible the largest single block of private or corporate credit in the United States. We suppose reasonably that it can be done again.

It would seem economically sound for the Government to correct the defect of too little mortgage money by encouraging the reflow of private investments into institutions set apart for home financing. The Government has demonstrated quite recently what it can do in the way of persuading reinvestment on the part of the people. By means of the Federal Deposit Insurance Corporation thousands of people have been led right back to the receiving teller's window at the banks. In many cases, unfortunately, money has lain idle there while it might have been at work in home financing channels. Some similar system for satisfactorily insuring the solvency of savings, building and loan investments could be established if given Government sanction. The Federal Home Loan Bank Board has been studying the problem.

The financier, therefore, is standing on the threshold of a saner era. But somebody also has to plan the house; a third party must supply the material for building, and still a fourth—the contractor—must construct the dwelling.

Every power of persuasion has failed to raise residential contracts let in January and February of this year to much more than $5,000,000 above the 1933 volume in the same months. The public has been deaf to pleadings so far as its sentiment can be recorded in money spent for home building. The fault undoubtedly lies somewhere among the four services essential to building.

The common claim is that the person who wants to build can not get financing. But as late as last month, Philip Lieber, President of the United States Building and Loan League, said that the cost of housing has always been too high in proportion to the income level of the people. Have we there a key to the failure of all oratory during the past two years about home building?

Speaking for an institution which can put its money into nothing but home loans, I feel we four who perform the services which the home owner must have should sit down together and work out something which will make into practical reality the right of the responsible American citizen to own his home. If cost is the trouble let us face the problem of costs honestly.

In considering the entire cost of a house we come back to the question of financing. It is popular talk that interest rates are too high. As long as we must depend upon the savings of the common people for any large part of the $21,000,000,000 required in home financing, we cannot set an interest rate by fiat of Government or of individual. If your neighbor and mine thinks that 4 per cent is sufficient return on his savings and is willing at that rate to keep those savings invested in a home mortgage institution, then building and loan associations can lend that money to the home owners at 5½ to 6 per cent.

HOME financing agencies are willing to make all possible cost adjustments to bring an owned home within the reach of a larger number of people. But are the architects, contractors and material dealers also willing to make adjustments to create a logical demand for homes? Every sound money lending organization prefers to work with a good architect when financing a newly built home. There could be established between financier and planner, a close working relationship, if the charges of the architect permitted the man of modest means to engage his services.

Many of us are not pleased with the thought that the American home may become a monotonous repetition of design reminiscent of rows of machine-perfected nuts and bolts. The high goal of individual home building can be maintained only by co-operation between financier and architect.

The costs of neither building materials nor labor are at all encouraging to the would-be builder. Added to these are the recently formulated codes in the building industry and in the manufacture of building materials. Both tend toward price fixing at high levels, the significance of which we fear time will all too fully demonstrate. It may well be that both the contractor and the manufacturer and seller of building materials must consider costs along with the architect and financier. I fail to see where five million or five billion dollars, even of direct Government lending, would cause any sound increase in home building if the average family cannot afford to buy or build.

SUCH are the out-of-line elements in the home financing prospect today. The building and loan associations have drawn up the following three-point program. They believe it to be a trump card for the Government to play in the present situation.

1. The expenditure of between half a million and a million dollars by the Federal Home Loan Bank Board to popularize home building, home repairs and remodelling and home buying. The general populace must be led back to a belief in the value of home owning. The ultimate success of the campaign would depend somewhat upon adjustment of building and planning costs more nearly to the income level.

2. To start a flow of home building funds, the investment of an additional half billion dollars by the Federal Treasury in the shares of building and loan associations, both the state-chartered and the Federally-chartered. Such a sum would be immediately available for loans in the community. The money would go largely to finance construction activities generated by the program outlined in Point 1 and would thus give rise to substantial employment of construction labor.

3. Establishment of a plan for optional insurance of the safety of thrift and home financing institutions, including building and loan associations, savings and loan associations, cooperative banks, homestead associations and mutual savings banks, along the lines used in the Federal Deposit Insurance Corporation. This allows development of the necessary savings capital which the institutions must have in order to carry on.

While Point 2 will give an almost immediate source of needed funds, the plan in Point 3 would provide a steady flow of savings to finance American homes.

The rebuilding of the home financing structure in America which has taken place in the last two years has been truly remarkable. But it must be understood that in economics we can anticipate no automatic results. The human element—fortunately or not—is always present.

The machine must be supplied with fuel, in the form of the peoples' savings. On the other hand it must have something definite to work on in the form of a home which the average family wants and can afford because it is low-priced and soundly built. The challenge to the architectural profession and to builders of all types is to make sure that the perfected machinery need not stand idle for lack of borrowers or investors. If the Government decides to give us the original lift in both directions by adopting the suggested program, are you willing to help carry on from there?

VAN ANDA

THERMAL INSULATION OF BUILDINGS

American Architect Reference Data

No. 11, May, 1934

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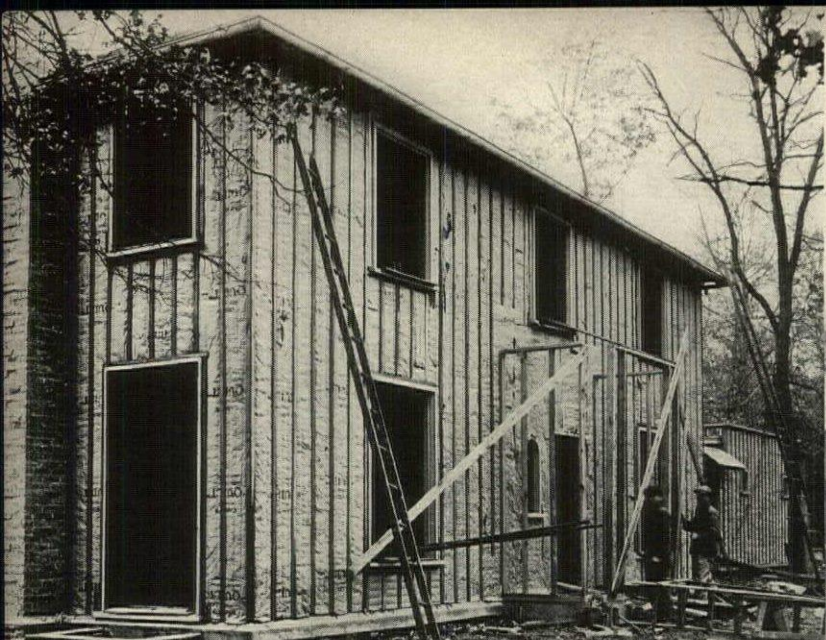
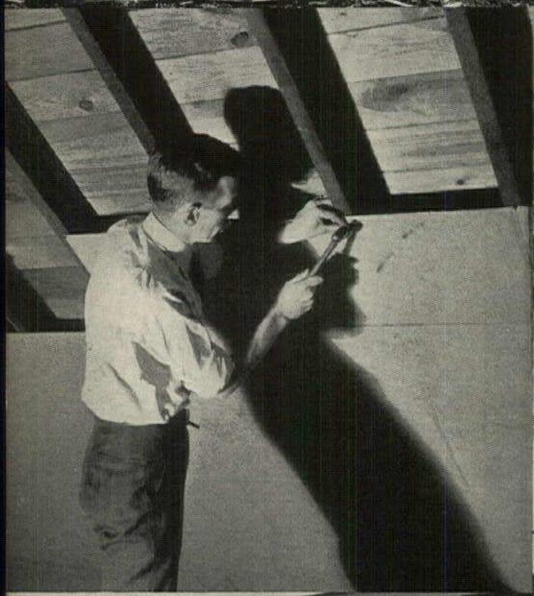
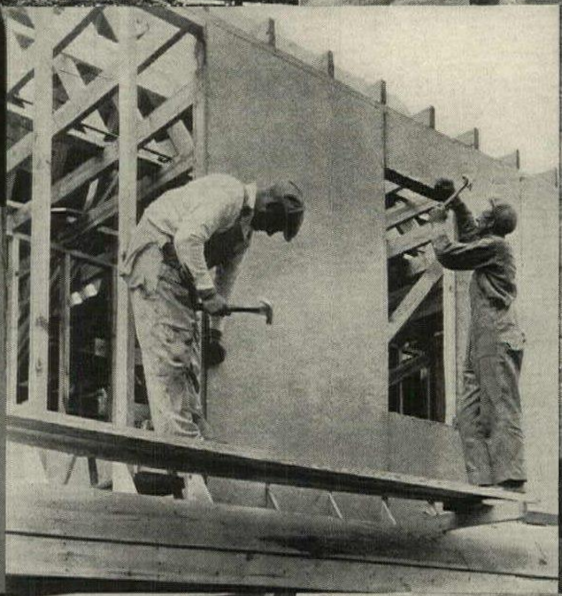
Presented in this article is a simplified method of determining economic values for all types of building insulation, multiple glazing and weather-stripping, together with several Time-Saver Tables never before published







Thermal Insulation of Buildings

AMERICAN ARCHITECT REFERENCE DATA

No. 11, May 1934

HEATING, cooling and air conditioning systems represent major items of cost in the equipment and operation of buildings. Both the initial investment and operating costs are directly affected by the rate at which heat may pass through walls, floors, roof and glass areas and by the amount of air entering the building through cracks or structural materials. The field of thermal insulation of buildings relates to the methods of reducing the rate of heat transfer and infiltration by the use of insulating materials, weatherstripping, multiple glazing or other means. Hence it has a direct economic bearing on heating and cooling installations in addition to its less tangible but equally important relationship to human comfort and health.

To simplify the study of this important field (which hitherto has required more than an ordinary knowledge of engineering procedure) two methods of appraising the value of thermal insulation methods are herein set forth. The first is a short-cut *visual* method for making preliminary selections. It employs a Time-Saver Table that gives the "Per Cent of Heat Transfer Stopped by Insulating Materials." Other similar tabulations apply to weatherstripping and multiple glazing. The Time-Saver Table, compiled from standard data but original in form and purpose, is published for the first time on the inserted pages.

The second method involves computation of actual values to determine the economic result obtained by using each method for reducing heat transfer. This "rational" method is simplified by specific rules and tables, which take the place of engineering formulas.

Facts needed for the study of any building include: (1) area in square feet of all walls, floors and roofs through which heat may be transferred, divided to show areas of differing construction and materials; (2) area in square feet of windows, skylights and outside doors; and (3) the length of "crack" around windows and doors. These data may be taken directly from drawings of the building or from the building itself. These figures are needed at the start so that proper attention may be given to each of the three sources of heat loss.

THE VISUAL "SHORT-CUT" METHOD

THIS method of making a preliminary study of the value of each means of reducing heat transfer begins with a comparison of the area of glass and the areas of all other surfaces. The rate of heat transfer through single glazing runs from two to five times the rate through normal types of wall or roof construction. (See inserted Time-Saver Table and Table I.) Multiple glazing (and hollow glass masonry) can reduce by 50% to 67% the amount of heat transfer through ordinary single glazed windows. The use of insulation may similarly reduce heat losses through walls and roof in any desired degree up to 80% or more. Hence, the proportion of glass area to total wall and roof area in a given building roughly indicates how much of the total heat loss can be controlled by double glazing and how much by the use of insulating materials.

Infiltration is neglected in this preliminary study. It can only be determined by computations as described later. Furthermore, the use of weatherstripping to eliminate drafts may be more important than its use to reduce infiltration losses.

Glass Area Losses—the transfer of heat through the glass and frames of windows, doors and skylights—can be checked only by one method at present: the use of double or triple glazing with dead air spaces between the panes. The effectiveness of this method is indicated in Table I. Glass masonry units may be treated as windows or as special wall sections. Transmission data vary widely according to the type of glass masonry employed.

It should be noted that ordinary glass, whether used in single sheets or in multiple glazing, does not prevent the entrance of sun heat. Special considerations, not covered here because of their complexity, affect the calculation of cooling loads through glass.

Wall, Roof and Floor Losses—due to the transfer of heat through building elements that separate heated or cooled areas from outdoor temperatures or unconditioned space—can be lessened by introducing insulating materials of appropriate type and thickness into the structural sections.

The inserted Time-Saver Table showing "Per Cent of Heat Transfer Stopped by Insulating Materials" presents twelve sections of walls, floors and roofs which typify all normal types of construction into which insulating materials may be introduced. In each section there may be from one to five positions in which some type of insulation may be used. Four basic types of insulation—rigid boards, flexible blankets, loose fills and reflective metals—are listed by thicknesses which are commonly used or commercially available.

For each place in the twelve structural sections where insulations may be used, two values are given: (1) the coefficient of transmission of the entire assembly insulated as shown, and (2) the per cent of heat transfer stopped by adding that particular type and thickness of insulation in the location shown. This percentage is obtained by relating the transmission of heat of the section without insulation (shown as the value for "*U*" at the top of the diagrammatic section) to the over-all transmission after insulation is added.

These percentage figures make it evident that almost any desired degree of heat transfer reduction can be attained with any of the four basic types of insulation. Questions that must be answered are:

(1)—How much insulation should be used to show the most desirable economies in initial cost of equipment and in expenditures for fuel?

(2)—What basic types of insulation are best adapted to the various parts of the structure?

Accurate answers to these questions can easily be obtained by following the "rational method" of computing each element as presented later. But any person reasonably familiar with building costs can visually select types and thicknesses of insulation worthy of detailed consideration in a specific project from the values shown in the Time-Saver Table.

Four Factors Affect Insulating Value of materials: (1) their inherent resistance to the passage of heat; (2) their thickness (except for reflective insulations); (3) their position in the construction with respect to internal air spaces; and (4) the resistance of the uninsulated construction to which they are added.

These facts are demonstrated in the Time-Saver Table. The importance of position, however, needs explanation. In addition to the resistivity or resistance of each kind of material through which heat must pass, whether it be brick, stone, wood, plaster or materials used primarily as insulators, there is a "surface" resistance somewhat analogous to a protective film. Since this film is affected by wind velocity, the surface resistance is greater in still air than where there is vigorous wind movement. This surface resistance appears only where the material is exposed to open air or to a measurable enclosed air space.

The surface resistance of materials enclosing air space within a wall, floor, or roof are combined for convenience and expressed as the resistance of the air space. If an insulating material completely fills the hollow part of a wall there is no air space to be computed. If insulating material (other than reflective metal) is used on one side of an air space, its addition to the structure does not change the resistance of the air space. But if insulation is used between studs, rafters or joists to divide the normal air space into two or more separate air spaces, each space contributes its own resistance to the passage of heat. Where reflective type insulations are used facing an air space, a special value for the air space resistance is used. See Table V.

These facts show how inadequate it is to select insulating materials merely upon their inherent resistance to the passage of heat or upon their cost at the dealer's yard. Many other values require consideration before a selection is made.

Multiple Uses of Insulation Materials often contribute savings in construction costs that should be credited when studying the economic value of insulating materials. Some rigid insulating boards have structural strength superior to horizontal wood sheathing. Used in the requisite thickness to give the required reduction in heat transfer, they may save the cost of wood sheathing and the labor involved in its application. Most rigid insulations are offered in forms suitable for use as plaster bases, eliminating the cost of lath. They are also used as surface finishes in themselves, eliminating plaster and sometimes even painting costs.

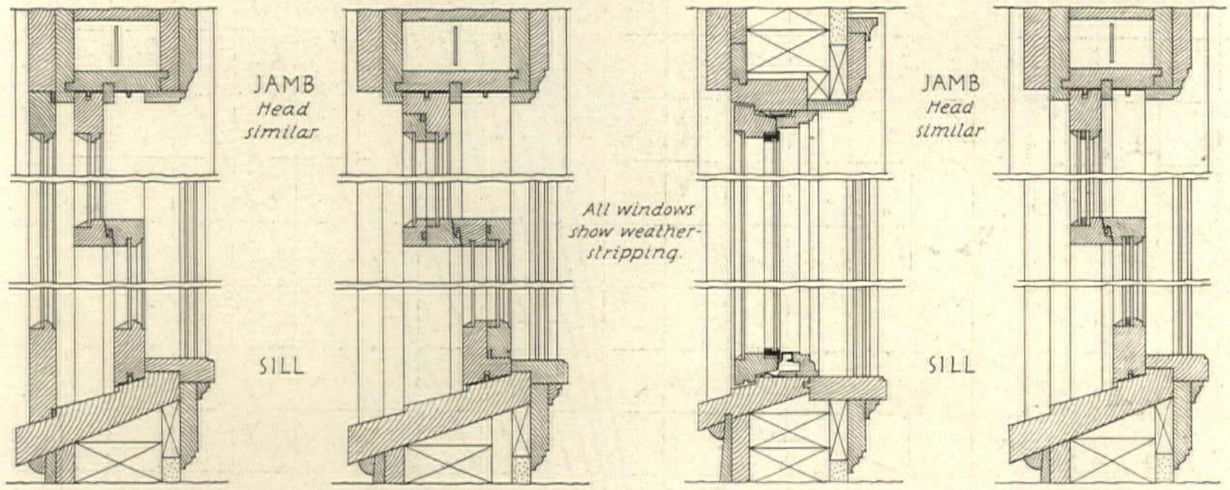
Fill-type insulations have proved their value as fire-stopping in walls. Blanket and reflective metal insulations properly installed reduce infiltration to zero, and may (in some cases) eliminate the use of building papers. All types have a greater or less value in sound insulation according to the way they are installed. Insulations used as interior finishes may contribute materially to acoustical properties. Reflective metals are available in combination with several types of plaster bases, thus serving two purposes at one installation cost.

These secondary uses of insulation materials deserve full consideration in evaluating the worth of each type for any specific project, but it may be observed that no one type or brand of insulation shows the highest economies under all conditions. And it is particularly important that neither the primary function of insulation, nor the secondary function an insulating material may serve, be sacrificed for the sake of what appears to be a slight initial economy.

Cost Installed is a major factor in selection. The cost should include (1) cost of material delivered at site in the thicknesses to be used, (2) cost of application or installation, (3) cost of secondary materials needed to complete the installation correctly, including waterproof building papers, nailing strips or blocks, or attachment accessories of any kind, and (4) costs due to interference with other trades or delays in completion of the structure.

From these costs should be subtracted the value of materials and labor eliminated by the use of the selected insulation. Some savings will be actual economies, as for example, where an acoustical or sound insulating material, a plaster base, a sheathing, or special firestopping can be eliminated from the specification. Intangible savings include the greater quietness or comfort the owner receives.

METHODS OF DOUBLE GLAZING TO LESSEN HEAT LOSSES



STORM SASH *or* WINTER WINDOWS
Storm sash must be tightly fitted on felt weatherstripping to minimize infiltration

DOUBLE HUNG WINDOW *with* INSERTED DETACHABLE DOUBLE GLAZING FRAMES

CASEMENT WINDOW *with* DETACHABLE DOUBLE GLAZING FRAME

ORDINARY WINDOWS GLAZED WITH COMPOUND GLASS
Two panes, spaced and sealed, in each opening.

Reduction in Cost of Heating or Cooling Equipment should be credited against the cost of insulation, multiple glazing and weatherstripping in proportion which each contributes to the total amount of heat transfer stopped by all methods combined. Methods of computing these savings are given later.

Reduction in Annual Fuel Costs is usually the dominant factor in determining how much insulation should be used. The saving in fuel cost resulting from the use of any insulation will be influenced directly by (1) the cost of the fuel per unit of heat delivered, and (2) the original quality of construction. If the building without insulation has a very appreciable resistance to the passage of heat, it will take a great deal of insulating material to effect a large reduction in heat losses. In short, the poorer the original construction the greater the return on the investment in insulation.

Fuel costs vary over a wide range. This may be observed by noting the calorific value of common fuels in Table VI and multiplying these figures by the prevailing local costs of each fuel, then reducing the products to a common basis of cost per thousand or million B.t.u. The higher the fuel cost, the greater the saving in dollars per season shown by a given amount of insulation. Increasing the amount (and cost) of insulation increases the annual fuel saving in dollars per season but diminishes the annual return on the investment.

These values may be illustrated in the following comparison based on arbitrarily assumed costs for 5000 sq. ft. of wall.

	Amount of Insulation Added		
	Minimum	Average	Maximum
Over-all Coefficient of Transmission (original structure .262)	.220	.172	.055
Per Cent of Heat Transfer Stopped	16%	34%	79%
Cost of insulation	$50.00	$225.00	$750.00
Fuel savings in dollars:			
coal @ $10 per ton	23.00	50.00	110.00
oil @ 7¢ per gal	26.00	55.00	123.00
gas @ 75¢ per M cu. ft.	64.00	138.00	304.00
Return on investment:			
coal	46%	22%	15%
oil	52%	25%	16%
gas	128%	61%	40%

It will be noted that the minimum investment shows the highest return for each of the three fuels, but this is seldom the best basis upon which the amount of insulation should be determined. In this example the minimum investment would pay for itself in about two years in saving of coal and oil, and in less than a season where gas is used. The maximum investment in insulation would pay for itself in about six years in the case of low-cost fuels and in about three years in the case of the expensive fuel. But after the investment had been completely repaid the minimum insulation would only save from $23 to $64 per year on fuel bills while the maximum investment would return from $110 to $304 per year. This saving might extend over a period of a great

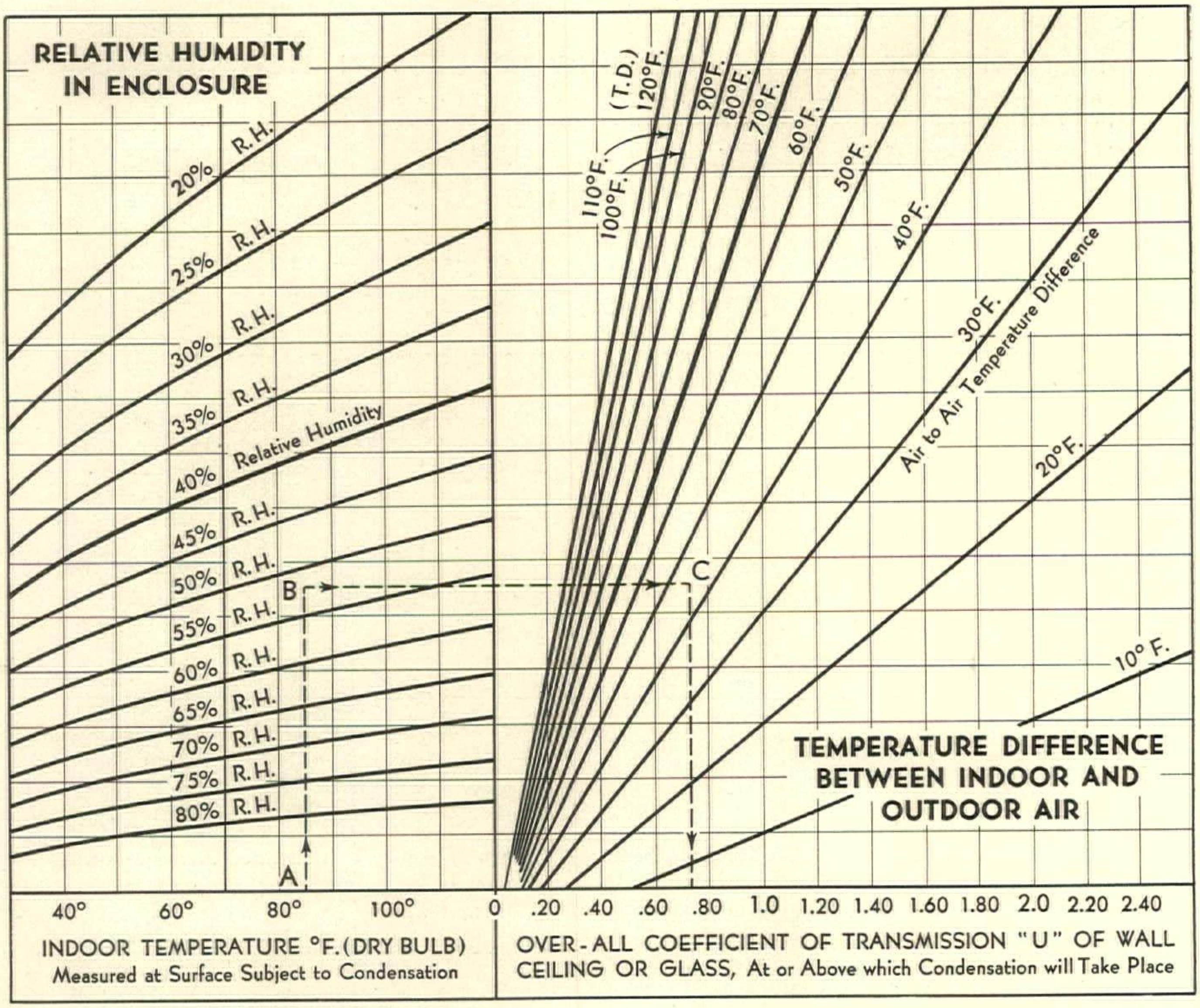


CHART I—CONDENSATION—Curves showing the coefficient of transmission "U" of any construction or glass area at or above which condensation will occur on the innermost surface under given conditions. Use chart as indicated by dotted lines, proceeding from indoor temperature (as at A) to indoor relative humidity (as at B) to temperature difference (as at C—indoor temperature less lowest selected outdoor temperature), to bottom of chart where desired cceefficient of transmission will be indicated

many years; hence in the long run the greatest return in dollars would come from the most effective insulation that can be installed.

Prevention of Condensation is a function of insulation which may well be used as a guide to what is the desirable minimum amount of insulation which should be installed in any building. Winter air conditioning equipment shows every promise of becoming universally adopted as a necessary adjunct to heating. Future humidification should be anticipated in every insulation project. Recommended humidities range from 30% to 65% from a health point of view, but are limited in practice to about 40% maximum because of the tendency to excessive condensation on glass areas with higher humidities.

A simplified chart, developed especially for publication in this article, can be used to determine the over-all coefficient of transmission *U* of any construction or glass area required to prevent condensation under any normal condition. To use this chart determine the probable maximum relative humidity which the owner may maintain within the building, the indoor temperature of the surface under consideration (noting that temperatures at ceiling levels are normally higher than temperatures at breathing zone by approximately one degree per foot of height), and the minimum outdoor temperature at which condensation may be tolerated. This last point recognizes the fact, that, in extremely cold weather it may be more economical to lower the relative humidity indoors, by adjusting the humidostat, than to provide sufficient insulation (particularly on glass areas) to prevent condensation under most extreme conditions. A general average humidity of 40% may be assumed when more precise data are lacking. With these data at hand, follow the instructions accompanying the chart.

Other Factors influencing the selection of insulating materials are:

Dampness affects the insulating efficiency of practically all insulating materials. None of the insulating materials commonly used is inherently hygroscopic but all of them absorb and hold water to a greater or less degree. For this reason it is always advisable to use a waterproof building paper or other membrane on the outside of any insulating material to minimize the chance of leakage through walls or roof, wetting the insulation and temporarily destroying its insulation value. By good workmanship and proper installation any material may be adequately protected against excessive moisture.

Parenthetically, it may be noted that water vapor will enter any insulation that is not hermetically sealed. This vapor may condense within the insulation itself, forming a damp section, or even a layer of ice. If the insulation is unharmed by this wetting and subsequent drying, the only effect is to reduce over-all insulating effectiveness when this internal condensation takes place.

Permanence of insulating effect requires that the material once installed should remain permanently as placed, particularly in the case of fill-type insulations. These should be able permanently to resist any tendency to settle and thus leave air spaces without their designed insulating value.

Durability under climatic conditions and through inherent permanency and stability of the material itself should influence selection. Ability to resist destruction by fungi and termites affects durability.

Fire safety is a consideration. Materials may act as effective firestops though themselves combustible if they are slow burning or do not tend to support combustion. Practically no insulation in common use adds any fire hazard to the structure; the majority reduce this danger.

Sound insulation and acoustical value are usually inherent in thermal insulating materials to varying degrees. By proper study of type, placement and thickness it may be possible to combine sound and thermal insulation in one material.

Multiple Glazing offers a major opportunity for the reduction of heat losses from buildings particularly those having proportionately large glass areas. The tendency toward the use of large windows in modern structures increases the significance of multiple glazing and the value of glass masonry. As much as half the total heat transfer from a building may occur through glass areas. Damage due to condensation and impaired vision and lighting due to fogging or frosting of single glazed windows may result in losses more important than loss of heat.

Methods of minimizing heat losses through glass areas are shown on page 91. As elsewhere noted storm sash is effective only when the sash is tightly fitted to minimize air infiltration. The large air space is less effective than a more limited space; approximately one half inch shows best results. A variation of this method is the installation of two complete windows, each permanently installed and suitably weatherstripped. A third method recently suggested and employed by one architect is the construction of a special double hung sash with frames rabbeted to permit the removal of an inserted fixed framework in each sash as shown in the drawing. This removable frame permits cleaning the surfaces of glass enclosing the dead air space. Casement windows are now commercially available with a similar detachable inner glass. The fourth is to use double glazing in ordinary double hung or casement sash, the double glazing consisting of two panes of glass separated by suitable stops. Air within this space should be dehydrated to prevent condensation between the panes, and the two panes should be hermetically sealed. For data on the effect of double and triple glazing see Table I.

Weatherstripping is a relatively low cost method of reducing heating and cooling costs in addition to its value in minimizing drafts and in keeping out dust. The per cent of infiltration stopped by weatherstripping is shown in Table II. It will be noted that weatherstripping, like insulation, shows the greatest effectiveness where workmanship on other parts of the structure is poor. On a well-fitted window or door weatherstripping may reduce infiltration from 28% to 40%. On a poorly fitted window the reduction may run from 63% to 78%. Methods of computing the economic value of weatherstripping are discussed under the rational method.

THE RATIONAL METHOD

THIS system of selecting thermal insulations, based on their economic value, is much to be preferred over the short cut method just described. It is a simplification of the methods employed by mechanical engineers in their precise computations. It involves no formulas. Its accuracy is more than sufficient for all normal projects, only a few uncommon conditions being neglected for simplicity.

The Economic Chart (Chart II), appearing on pages 94 and 95, represents a convenient work sheet for summarizing each step in a typical analysis. Any twelve-column accounting form may be used in its place. The first five numbered columns provide places to record data pertaining to the project being studied. These values do not change thereafter. The sixth column is used to enter the per cent of heat transfer stopped by the thermal insulation improvements tentatively selected. Thereafter, simple calculations show the savings in radiation and fuel resulting from the use of insulation, multiple glazing, and weatherstripping, as selected.

AMERICAN ARCHITEC

ECONOMIC CHART for the rational determination c

FACTORS GOVERNED BY UNINSULATED BUILDING & LOCAL CONDITIONS					
PART OF BUILDING	1 Areas - sq. ft. Infiltration - c.f.	2 Coefficient of transmission U	3 Heat required per hr per °F in Btu.	4 Maximum temp. difference in °F	5 Average temp. difference in °F
Sources of data	Areas from plans Infiltration from Rules 1 or 2	From Time Saver Table, and Table I, or by Rule 3	Multiply Col. 1 by Col. 2	From Table IV Column 2. Subtract from 70°	From Table IV Column 1 Subtract from 70
WALL AREAS / ROOF AREAS — *List separately each area of different construction* / FLOORS over unheated space				(usually 35-40°)	
TOTALS FOR AREAS AFFECTED BY USE OF SELECTED INSULATION MATERIALS					
GLASS AREAS *List separately, windows, doors, skylights, etc.*					
TOTALS FOR AREAS AFFECTED BY USE OF MULTIPLE GLAZING					
INFILTRATION *List each source separately*		0.018			
TOTALS FOR OPENINGS WHERE WEATHERSTRIPPING MAY BE USED					
GRAND TOTALS					

WORK SHEET FORMS

upon which is based a simplified method of calculating the dollar value of any form of thermal insulation

DOLLARS INVESTED, ANNUAL SAVINGS AND RETURN ON INVESTMEN

	LINE	*SOURCE*	*INSULATION*	*GLAZING*	*WEATHRSTPG*	*TOTALS*
Total heat saved by improvements Percent saved by each method	A	Column 8 Compute	Btu %	Btu %	Btu %	Bt 100 %
ESTIMATED COST of each method of thermal insulation	B	Contractors Estimates	$	$	$	$
VALUE of MATERIALS and LABOR SAVED where insulation displaces other work	C	Contractors Estimates	$	$	$	$
NET COST of insulation, multiple glazing and weatherstripping	D	Subtract C from B	$	$	$	$
VALUE OF RADIATION SAVED incl. reduced cost of boiler or furnace if any	E	Estimated from Col. 9	$	$	$	$
ACTUAL INCREASE or DECREASE in total investment due to improvements	F	Subtract E from D	$	$	$	$
VALUE OF FUEL SAVED each season due to investment in thermal insulation	G	Col. 12 x cost of fuel	$	$	$	$
RETURN ON INVESTMENT paid by annual fuel savings	H	Divide G by F x 100	%	%	%	%

EFERENCE DATA - CHART II

he dollar value of insulation, multiple glazing & weatherstripping

ELECTED % H.T.S.	RADIATION SAVED			FUEL SAVED PER SEASON		
6 Per cent heat transfer stopped	7 Maximum Btu required per hr.	8 Heat saved in Btu. by insulation	9 Equivalent direct radiation saved.	10 Total Btu per heating season	11 Fuel required annually-no insul.	12 Fuel saved per season
Select as desired rom Time Saver Table Tables I, II, Rules 3&4	Multiply Col 3 by Col 4	Multiply Col 7 by Col. 6	Divide Col. 8 by 240 (for steam)	Multiply Col. 3 by Col. 5 and by 5040 hours.	Divide Col. 10 by calorific value of fuel. Table VI	Multiply Col 11 by Col. 6

To simplify the use of this chart the source of data for each column is given first, followed by a series of simple rules. These rules may be used to obtain any values that cannot be found in the tables published herewith.

Column 1. Areas of all surfaces through which heat transfer will take place should be computed from the building itself or from its plans, and entered in the first column, as indicated. Wall areas are net exposed exterior surfaces computed by measuring the gross areas and deducting the areas of all openings. These openings are listed separately under "Glass Areas" in the same column. Roof areas are figured according to the manner in which insulation is to be used. If the ceiling of the top floor is to carry insulation, this ceiling area should be listed as roof area; but if the sloping roof is to be insulated, its net area over heated space (deducting eaves, skylights, etc.) should be used. In all cases list separately the areas of different construction.

The third horizontal section of the chart provides a place for recording the infiltration of air in cubic feet. This may be computed by following Rule I, which uses the lineal feet of crack around windows and doors as the measure of infiltration, or by using Rule II, which is a less accurate approximation based on the average number of air changes taking place in typical rooms.

Column 2. The coefficient of transmission *U*—which means the number of B.t.u. transmitted per hour per degree F. difference in temperature by one square foot of assembled construction—may be found in the Time-Saver Table if the construction is identical with one of the uninsulated sections diagrammatically illustrated at the top of this table. Over-all coefficients of transmission of other typical building sections are published in the A. S. H. V. E. Guide, 1934. The coefficient of transmission through glass areas may be found in Table I.

Where the transmission of a given type of construction cannot be derived from these tabular sources, it may readily be computed by following Rule III. It should be noted that in all cases the coefficients of transmission entered in Column 2 are those of the building construction before adding any specific insulating material, double glazing, or weatherstripping.

In the section of the column devoted to infiltration losses the value equivalent to a coefficient of transmission is the factor 0.018.

Column 3 is computed by multiplying the areas and volumes in Column 1 by the coefficients in Column 2.

Column 4 records the *maximum* temperature difference in degrees F. This temperature is the difference between the desired indoor temperature during the winter heating season and the coldest outdoor temperature prevailing in the locality. The minimum temperature should be the lowest temperature ever recorded in the vicinity, but sometimes it is taken at 10° to 15° above the minimum. See Table IV, Column 2. Note that the desirable temperature in garages or storage space may be less than that required in living or business quarters, and that the temperature difference for floors over unheated space should make an allowance for the fact that unheated space is frequently warmer than the minimum outdoor temperature.

Column 5 records the *average* temperature difference in degrees F. prevailing throughout the heating season. This average temperature difference is obtained by subtracting from the desired indoor temperature the average outdoor temperature prevailing throughout the heating season, as given in Table IV, Column 1.

Column 6 should be used to enter the per cent of heat transfer stopped by the selected methods of reducing heat losses. Where only one type of insulating material is used in a given construction area, the per cent of heat transfer stopped can be taken directly from the Time-Saver Table. The per cent of heat transfer stopped by multiple glazing can be found in Table I and the per cent of infiltration stopped by weatherstripping will be found in Table II.

Where materials are employed for insulation purposes in any manner differing from the methods covered in the Time-Saver Table or Tables I and II, the percent of heat transfer stopped may readily be calculated by following Rules III and IV.

Columns 7, 8 and 9 develop the radiation saved by the use of insulation, multiple glazing, or weatherstripping. The method of obtaining the values is clearly shown in Chart II and is covered by Rule V.

Columns 10, 11 and 12 develop the fuel saved per season by a similar series of calculations which are indicated in Chart II and are presented in detail in Rules VI, VII and VIII.

TO DETERMINE INFILTRATION

BECAUSE there exists a difference in pressure between the air inside and outside of every heated or cooled building, air will seek to pass through all cracks or openings, and even directly through structural walls and roofs until the pressures are equalized.

Air leakage through walls and roofs is important if workmanship is poor and negligible if workmanship is good. The use of stout building paper in wood construction or good plastering in either wood or masonry construction reduces infiltration to a point where losses from this cause may be neglected. A high grade waterproof building paper should be used wherever construction permits, and workmanship should be carefully supervised to assure tight fitting at all laps and around all openings. Plaster work should be carefully sealed at baseboards and all cracks should be filled. These precautions eliminate need for computing air infiltration through structural areas under normal conditions.

But infiltration through cracks around doors and windows must be considered. The amount of air entering through cracks around windows and doors may be computed from Table II according to the type of window, use of weatherstripping and quality of workmanship, or by assuming a certain number of air changes in each room as given in Table III.

Infiltration based on "crackage" represents the more precise method of determining the volume of outside air to be heated. In Table II will be found the "cubic feet of air per hour per lineal foot of crack" entering through various types of windows under different wind pressures. First select the prevailing average wind velocity from Table IV, Columns 3 and 4. Measure the lineal feet of crack as follows:

For double hung windows take the perimeter plus the length of the meeting rail. For casements and pivoted windows take the aggregate perimeter of all movable or ventilating sections. In the case of poorly fitted steel sash a further allowance for leakage of frames at mullions and where windows contact steel work may be computed, but is neglected here. Proper caulking of frames is assumed in these values. The effect of caulking is important, reducing infiltration about 85% from that of uncaulked frames; but as caulking is not always thoroughly installed, average values are used in this table.

Note, however, that since air entering on one side of the building must leave through cracks on the other, the amount of crack used in computations is as follows: In a room having one exposed wall, take all the crack. With two exposed walls, use the wall having the most crack. With three or four exposed walls, take the wall having the most crack but in no case use less than half of the total crack.

Rule I. *To determine the total amount of air entering through cracks around doors and windows (using Table II) select the infiltration value in cubic feet for the prevailing wind velocity and multiply by the lineal feet of crack as above determined to arrive at the cubic feet of air entering per hour.*

Infiltration based on air changes is a shorter but less accurate method. Using values given in Table III as normal averages, follow Rule II.

Rule II. *Multiply the cubic volume of each room having an outside exposure by the number of air changes taking place per hour as given in Table VI to find the cubic feet of entering air.*

AMERICAN

PERCENT OF HEAT TRANSFE

DEFINITIONS

U Over-all coefficient of heat transmission (thermal transmittance) in B.T.U. per hour per sq. ft. of assembled structural section per degree F. difference in temperature on exposed faces.

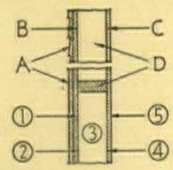
% Percent of heat transfer stopped = $\frac{U\text{ (not insulated)} - U\text{ (insulated)}}{U\text{ (not insulated)}} \times 100$

k Thermal conductivity of homogeneous material in B.T.U. per hour per sq. ft. per inch thickness per degree F. difference in temperature on exposed surfaces.

C Thermal conductance same as *k*, but for non-homogeneous materials.

I Wood Stud Wall **U=.26**

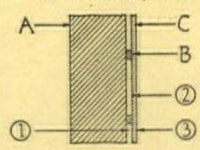
A. Siding or clapboards B. Wood sheathing 1" C. Metal lath & plaster D. Studs 3¾"



① in place of sheathing
② under sheathing ③ between studs
④ under plaster and lath
⑤ as plaster base *(no metal lath)* 1/2" plaster.

II Masonry Wall **U=.25**

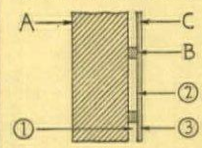
A. solid brick wall 12" B. ¾" furring strips C. ¾" mt'l lath & plaster



① between furring strips
② under lath & plaster
③ as plaster base *(no metal lath)* with ½" plaster.

III Masonry Wall **U=.25**

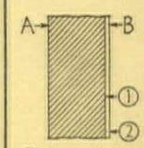
A. solid brick wall 12" B. 2" furring strips C. ¾" mt'l lath & plaster



① between furring strips
② under lath & plaster
③ as plaster base *(no metal lath)* with ½" plaster

IV Mas. Wall **U=.34**

A. solid brick 12" B. ½" plaster applied direct



① cemented to wall and plastered 1/2"
② cemented to wall, no plaster.

V ...

TYPE OF MATERIAL	Thickness	I-1 U %	I-2 U %	I-3 U %	I-4 U %	I-5 U %	II-1 U %	II-2 U %	II-3 U %	III-1 U %	III-2 U %	III-3 U %	IV-1 U %	IV-2 U %	V-1 U %
RIGID BOARD (Average fibre board) (Average cork board) *k*=.33	½"	.24 8	.18 31		.18 31	.19 27		.18 28	.19 24		.18 28	.19 24	.22 35	.23 32	.18 2
	1"	.17 35	.14 46		.14 46	.15 42		.14 44	.15 40		.14 44	.14 44	.17 50	.17 50	.14 4
	1½"	.14 46	.12 54		.12 54	.12 54		.12 52	.12 52		.12 52	.12 52	.13 62	.14 59	.12 5
	2"	.11 58	.10 62		.10 62	.10 62		.10 60	.10 60		.10 60	.10 60	.11 68	.11 68	.10 6
k=.30	½"	.23 12	.18 31		.18 31	.18 31		.18 28	.18 28		.18 28	.18 28	.22 35	.22 35	.18 2
	1"	.17 35	.14 46		.14 46	.14 46		.14 44	.14 44		.14 44	.14 44	.16 53	.16 53	.14 4
	1½"	.13 50	.11 58		.11 58	.11 58		.11 56	.11 56		.11 56	.11 56	.13 62	.13 62	.11 5
	2"	.11 58	.10 62		.10 62	.10 62		.09 64	.10 60		.09 64	.10 60	.10 71	.11 68	.09 6
FLEXIBLE OR BLANKET TYPE *k*=.27	½"	.22 15	.17 35	.15 42	.17 35		.19 24	.17 32		.15 40	.17 32				.17 3
	1"	.16 38	.13 50	.12 54	.13 50			.13 48		.12 52	.13 48				.13 4
	1½"	.12 54	.11 58	.10 62	.11 58			.11 56		.11 56	.11 56				.10 6
	2"	.10 62	.09 66	.08 69	.09 66			.09 64			.09 64				.09 6
FILL TYPE *k*=.30 (Average mineral wool and fibre fills)	1⅝"									.12 52					
	3⅝"			.07 73											
k=.48 (Average powdered gypsum fill)	1⅝"									.16 36					
	3⅝"			.10 62											
BRIGHT ALUMINUM FOIL (REFLECTIVE TYPE) See "Notes" at right for description of types.	TYPE 1		.19 27		.19 27			.19 24			.19 24				.19 2
	TYPE 2			.14 46			.16 36			14 44					
	TYPE 3														
	2 layers			.10 62						.10 60					
	3 layers			.08 69											
	4 layers			.07 73											

TABLE I

HEAT LOSS THROUGH GLASS AND DOORS

WINDOWS AND SKYLIGHTS

(Glazing)	Coefficient of Transmission U	Percent heat transfer stopped
SINGLE SHEET OF GLASS	1.13	**0.0%**
DOUBLE GLAZING *	.56	**50%**
TRIPLE GLAZING	.37	**67%**

* Double glazing is considered to be two sheets of glass not over 1/2" apart in the same frame. These values are computed; actual tests on full size windows now under way indicate they represent ideal conditions, and more conservative figures should be used under actual field conditions.

DOORS

(Thickness) Nominal	Actual	Coefficient of Transmission U
1"	25/32"	.69
1¼"	1 1/16"	.59
1½"	1 5/16"	.52
1¾"	1⅜"	.51
2"	1⅝"	.46
2½"	2⅛"	.38
Thin panels over large area		1.13

DOUBLE H

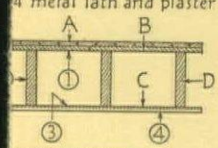
Wind Velocity Miles P.H.	*(Average Windo* Plain	Weathe
5	6.6	
10	21.4	
15	39.3	
20	59.3	
25	80.0	
30	103.7	

ALL DOORS Use double the

ARCHITECT REFERENCE DATA — TIME SAVER TABLE

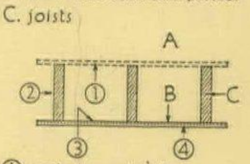
ER STOPPED BY BUILDING INSULAT

Wood Fl. Joist & Ceiling U=.25
/16" oak flooring D. joists
/32" yellow pine sub-flooring
4" metal lath and plaster



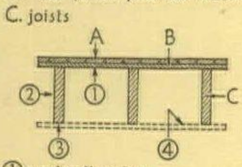
nder flooring
etween joists
bove metal lath and plaster.
s plaster base *(no metal ath)* with 1/2" plaster.

VI Top Fl. Ceiling *(no floor)* U=.69
A. open attic
B. 3/4" metal lath and plaster
C. joists



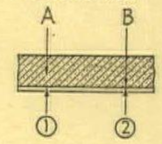
① nailed over joists.
② between joists
③ above metal lath and plaster.
④ as plaster base *(no metal lath)* with 1/2" plaster.

VII Fl. over Unheated Space U=.34
A. 13/16" oak flooring
B. 25/32" yellow pine sub-flooring
C. joists



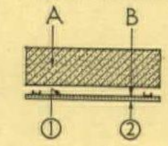
① under flooring
② between joists
③ fastened beneath joists
④ above 1/2" rigid insulating board (k=.33) used to retain fill.

VIII Mas. Ceiling U=.54
A. 6" reinforced concrete.
B. 1/2" plaster ceiling applied to concrete



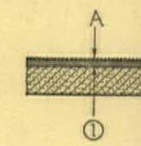
① cemented to slab as plaster base, 1/2" plaster.
② cemented to slab in place of plaster.

IX Susp. Ceiling U=.33
A. 8" concrete slab
B. 3/4" pl. & m'l'l lath ceiling suspended on channels.



① above metal lath and plaster
② as plaster base *(no m'l'l lath)* 1/2 plaster.

X Mas. Roof Deck
A. built-up compo roofing on 6" co slab roof.



① under compo roofing laid or

	V 2	V 3	V 4	VI 1	VI 2	VI 3	VI 4	VII 1	VII 2	VII 3	VII 4	VIII 1	VIII 2	IX 1	IX 2	X 1
%	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %
8		.18 28	.18 28	.26 62		.34 50	.35 49	.23 32		.19 44	.15 56	.30 44	.31 43	.22 33	.22 33	.33 48
4		.14 44	.14 44	.19 72		.22 68	.23 67	.17 50		.15 56	.12 65	.20 63	.21 61	.17 48	.17 48	.22 66
2		.12 52	.12 52	.15 78		.17 75	.17 75	.13 62		.12 65	.10 71	.16 70	.16 70	.13 61	.13 61	.16 75
0		.10 60	.10 60	.12 83		.13 81	.13 81	.11 68		.10 71	.09 74	.13 76	.13 76	.11 67	.11 67	.13 80
8		.18 28	.18 28	.25 64		.32 54	.33 52	.22 35		.18 47	.14 59	.28 48	.30 44	.21 36	.22 33	.31 52
4		.14 44	.14 44	.18 74		.21 70	.21 70	.16 53		.14 59	.12 65	.19 65	.20 63	.16 52	.16 52	.20 69
6		.11 56	.11 56	.14 80		.16 77	.16 77	.13 62		.11 68	.10 71	.15 72	.15 72	.12 64	.13 61	.15 77
4		.09 64	.09 64	.11 84		.12 83	.12 83	.10 71		.10 71	.08 76	.12 78	.12 78	.10 70	.10 70	.12 81
2	.15 40	.17 32		.24 65	.24 65	.30 56		.21 38	.18 47	.18 47	.14 59			.21 36		
8	.12 52	.13 48		.17 75	.17 75	.19 72		.15 56	.13 62	.13 62	.11 68			.15 55		
0	.10 60	.10 60		.13 81	.13 81	.14 80		.12 65	.11 68	.11 68	.09 74			.12 64		
4	.08 68	.09 64		.10 86	.10 86	.11 84		.10 71	.09 74	.09 74	.08 76			.10 70		
	.11 56	.11 56			.15 78	.15 78					.09 74			.12 64		
	.06 76	.06 76			.07 90	.07 90					.06 83			.07 79		
	.13 48	.13 48			.21 70	.21 70					.11 68			.16 52		
	.09 64	.09 64			.11 84	.11 84					.08 76			.10 70		
4		.19 24		.28 59		.28 59		.20 41		.20 41				.23 30		
	.13 48				.17 75				.14 20					.16 52		
	.10 60				.12 83				.10 71					.11 67		
	.08 68				.09 87				.08 76					.09 73		
	.07 72				.08 88				.07 79					.07 79		

TABLE II

NFILTRATION THROUGH WINDOWS AND DOORS (IN CUBIC FEET PER FOOT OF CRACK PE

HUNG WOOD SASH WINDOWS *(UNLOCKED)*					DOUBLE HUNG-METAL WINDOWS *(UNLOCKED)*			ROLLED SECTION STEEL		
ows)		*(Poorly fitted Windows)*								
stripped	% Infiltration stopped by Weatherstr'p'g	Plain	Weatherstripped	% Infiltration stopped by Weatherstr'p'g	Plain	Weatherstripped	% Infiltration stopped by Weatherstr'p'g	Industrial Pivoted	Architectural Projected	Re C
4.3	**35%**	26.9	5.9	**78%**	20	6	**33%**	52	20	
15.5	**28%**	69.0	18.9	**73%**	47	19	**40%**	106	52	
23.6	**40%**	110.5	34.1	**69%**	74	32	**43%**	176	88	
35.5	**40%**	153.9	51.4	**67%**	104	46	**44%**	244	116	
48.6	**39%**	199.2	70.5	**65%**	137	60	**44%**	304	152	
63.4	**39%**	249.4	91.5	**63%**	170	76	**45%**	372	208	

values given above for windows nearest in character to doors used.

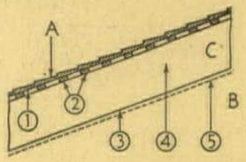
(Adapted from A.S.H.V.E Guide 1934 wit

TION MATERIALS

:64 — tion crete — tion slab.

XI Pitched Roof, Wood Shingles **U-47**

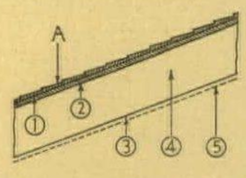
A. wood shingles on nailing strips.
B. heated attic. C. rafter



① under shingles ② under shingle lath
③ beneath rafters ④ between rafters
⑤ above sheathing of 1/2" fibre board (k=.33) used to retain fill.

XII Pitched Roof, Sheathed **U-56**

A. composition shingles or roofing, slate or tile on wood sheathing.



① under shingles ② under sheathing
③ beneath rafters ④ between rafters
⑤ above sheathing of 1/2" fibre board (k=.33) used to retain fill.

	XI 1	XI 2	XI 3	XI 4	XI 5	XII 1	XII 2	XII 3	XII 4	XII 5		
	U %	U %	U %	U %	U %	U %	U %	U %	U %	U %	Thickness	
	.27 43	.25 47		.22 53		.30 46	.30 46		.24 57		1/2"	RIGID BOARDS
	.19 60	.18 62		.16 66		.21 63	.21 63		.17 70		1"	RIGID BOARDS
	.15 68	.14 70		.13 72		.16 71	.16 71		.14 75		1 1/2"	RIGID BOARDS
	.12 74	.12 74		.11 77		.13 77	.13 77		.11 80		2"	RIGID BOARDS
	.26 45	.24 49		.21 55		.29 48	.29 48		.23 59		1/2"	RIGID BOARDS
	.18 62	.17 64		.16 66		.19 66	.19 66		.17 70		1"	RIGID BOARDS
	.14 70	.13 72		.12 74		.15 73	.15 73		.13 77		1 1/2"	RIGID BOARDS
	.11 77	.11 77		.10 79		.12 79	.12 79		.11 80		2"	RIGID BOARDS
		.23 51	.20 57	.20 57			.27 52	.22 61	.22 61		1/2"	BLANKETS
		.16 66	.15 68	.15 68			.18 68	.16 71	.16 71		1"	BLANKETS
		.12 74	.12 74	.12 74			.14 75	.12 79	.12 79		1 1/2"	BLANKETS
		.10 79	.10 79	.10 79			.11 80	.10 82	.10 82		2"	BLANKETS
					.10 79					.10 82	1 5/8"	FILLS
					.06 87					.06 89	3 5/8"	FILLS
					.13 72					.13 77	1 5/8"	FILLS
					.08 83					.09 84	3 5/8"	FILLS
		.23 51	.23 51				.25 55	.25 55			TYPE 1	ALUM. FOILS
				.15 68					.16 71		TYPE 2	ALUM. FOILS
											TYPE 3	ALUM. FOILS
				.11 77					.12 79		2 layers	ALUM. FOILS
				.09 81					.09 84		3 layers	ALUM. FOILS
				.07 85					.07 88		4 layers	ALUM. FOILS

NOTES

1 All calculations are carried to second decimal only.

2 All exterior surfaces are considered exposed to 15 M.P.H. wind; interior surfaces still air.

3 Insulating value of building paper is neglected.

4 All calculations, except those for bright aluminum foil, are based upon "Recommended Conductivities and Conductances for computing Heat Transmission Coefficients", A.S.H.V.E. Guide, 1934, (pg. 82)

5 Calculations for bright aluminum foil use the same "Recommended Conductivities" for all structural materials involved in the twelve constructions, but use latest available data (see reference note in text) for air spaces involving aluminum foil. Mean temperature used for foils is 50°F.

FOIL INSTALLATIONS

TYPE I Aluminum foil on one side of air space (either warm or cold side)

TYPE II Aluminum foil, bright both sides, dividing air space in two.

TYPE III Aluminum foil, bright both sides, used in multiple curtains, without metal-to-metal contact. Spacing of foils is considered uniform in narrow air spaces and in wide horizontal spaces is considered as over .75". In all cases where foil would otherwise face an infinite air space, building paper is included to form a limited air space.

ER HOUR)

SASH WINDOW — idential asement	Heavy Casement Projected	HOLLOW METAL WINDOWS — Vertically Pivoted
14	8	30
32	24	88
52	38	145
76	54	186
100	72	221
128	96	242

n Percents of Air Infiltration Stopped Added)

TABLE III
AVERAGE AIR CHANGES PER HOUR

KIND OF SPACE	Number of changes per hour	*KIND OF SPACE*	Number of changes per hour
Rooms, 1 side exposed	1	Living Rooms	1 to 2
Rooms, 2 sides exposed	1 1/2	Dining Rooms	1 to 2
Rooms, 3 sides exposed	2	Bath Rooms	2
Rooms, 4 sides exposed	2	Drug Stores	2 to 3
No windows or outside doors	1/2 to 3/4	Clothing Stores	1
Entrance Halls	2 to 3	Churches, Factories, Lofts, etc.	1/2 to 3
Reception Halls	2		

NOTE! Based on average conditions exclusive of air provided for ventilating.

To find the heat required to warm air entering by infiltration multiply the cubic feet of infiltering air as determined by Rule I or II by the factor 0.018. This gives the total B.t.u. per hour per degree F.

Chimney effect, caused in tall buildings by the tendency of heated air to rise through vertical shafts and openings, is neglected in these computations.

TO FIND CONDUCTIVITIES OF BUILDING SECTIONS

To compute the correct over-all coefficient of heat transmission U for any wall, floor, ceiling or roof section for which the coefficient cannot be found in existing tabular data, proceed as follows:

Rule III. *Add the Resistance (1/C) of each material, exposed surface, and air space in the given section, using the figures given in Table V. The sum of these resistances divided into 1 (the reciprocal of the sum) gives the coefficient of transmission (U) in B.t.u. per square foot per hour per degree F.*

Example 1: To compute the over-all conductivity U of Section I in the Time-Saver Table.

Exterior surface resistance (15 m. p. h. wind movement)	.17
Wood siding (shingles or clapboards)	.78
Wood sheathing—yellow pine or fir 25/32" thick	1.02
Air space between studs	.91
Metal lath and plaster	.29
Interior surface resistance—still air	.61
Over-all Resistance	3.78

$$\text{Over-all coefficient of transmission } U = \frac{1}{3.78} = .26 \text{ B.t.u.}$$

per square foot per hour per degree F.

TO FIND PER CENT OF HEAT TRANSFER STOPPED BY BUILDING INSULATIONS

To find what effect the addition of one or more layers of insulating material will have in a given structural section, the list of resistances used in Rule III should be made up and added again, omitting the resistance of any material (such as sheathing) which the insulation displaces, and adding any additional air spaces established by using the insulation. If multiple air spaces are created by the use of bright metals, the air space value should be omitted and the bright metal values substituted therefor, as explained below.

Example 2. To find the effect of using one inch of rigid insulating board in place of wood sheathing and the introduction of one inch blanket form insulation midway in the air space in the same wall:

Exterior surface resistance (15 m. p. h.)	.17
Wood siding (shingles or clapboards)	.78
1" rigid insulating board sheathing	3.03
First air space	.91
1" blanket insulation	3.70
Second air space	.91
Metal lath and plaster	.29
Interior surface resistance—still air	.61
Over-all Resistance	10.40

$$\text{Over-all coefficient of transmission } U = \frac{1}{10.40} = .09 \text{ B.t.u.}$$

per square foot per hour per degree F.

Reflective aluminum foils used as insulation must be associated with air spaces. The metal may be installed on one or both sides of an air space or as curtains dividing the air space into two to five separate air spaces. Thus in some cases an air space may have one side faced with aluminum foil and in other cases both sides may be bounded by foil. Values* for each condition and for two widths of air spaces are given in Table V.

According to recommended practice, curtains comprising multiple layers of foil are so installed as to keep the sheets well spaced apart, permitting no metal-to-metal contact. Industrial practice, using crumpled sheets that are self centering, is not recommended for building installations. If followed, it requires a reduction in insulating value to 75% of that allowed on spaced curtains to offset possible transmission of heat by direct conduction. It is also standard practice to use a building paper over open construction so that foil will always face a dead air space. The width of the air spaces formed will, of course, vary according to the construction, the number of curtains, and the method employed for spacing them apart.

To find the over-all coefficient of transmission of any construction involving bright aluminum foil, follow Rule III, substituting for the normal air space resistance (.91) the resistance of each air space bounded on one or both faces by bright metal as given in Table V. Note this table also includes values for standard assemblies of foils which save the addition of the separate air spaces.

Example 3. To find the effect of adding to the wall section defined in Example 1 an aluminum faced plaster base and two equally spaced curtains of foil within the air space:

Exterior surface resistance (15 m. p. h.)	.17
Wood siding (shingles or clapboards)	.78
Wood sheathing—yellow pine or fir 25/32" thick	1.02
First air space (bounded 1 side by foil) over .75"	2.17
Second air space (bounded both sides by foil) over .75"	2.44
Third air space (bounded both sides by foil, one being the curtain and the other the plaster base) over .75"	2.44
Metal (or gypsum) lath and plaster	.29
Interior surface resistance—still air	.61
Over-all Resistance	9.92

$$\text{Over-all coefficient of transmission } U = \frac{1}{9.92} = .10 \text{ B.t.u.}$$

per square foot per hour per degree F.

Having thus determined the over-all coefficient of transmission for each insulated section, we can determine the per cent of heat transfer stopped as follows:

Rule IV. *Subtract coefficient of transmission of insulated section from coefficient of transmission of same section before adding insulation and divide this difference by coefficient of transmission of uninsulated section. Multiply by 100 to obtain per cent of heat transfer stopped by the use of insulation.*

*Values used herein are based upon A. S. H. V. E. Research paper "Insulating Value of Bright Metallic Surfaces" by F. B. Rowley, and are the latest data available in this field.

TABLE IV — WINTER CLIMATIC CONDITIONS IN U. S.

State	City	Average Temperature, Oct. 1st-May 1st	Lowest Temperature Ever Reported	Average Wind Velocity, Dec., Jan., Feb., Miles per hour	Direction of Prevailing Wind, Dec., Jan., Feb.	State	City	Average Temperature, Oct. 1st-May 1st	Lowest Temperature Ever Reported	Average Wind Velocity, Dec., Jan., Feb., Miles per hour	Direction of Prevailing Wind, Dec., Jan., Feb.
Ala.	Mobile	57.7	— 1	8.3	N	Nev.	Tonopah	39.6	— 7	9.9	SE
	Birmingham	53.9	—10	8.6	N		Winnemucca	37.9	—28	9.5	NE
Ariz.	Phoenix	59.5	16	3.9	E	N. H.	Concord	33.4	—35	6.0	NW
	Flagstaff	34.9	—25	6.7	SW	N. J.	Atlantic City	41.6	— 7	10.6	NW
Ark.	Fort Smith	49.5	—15	8.0	E	N. Y.	Albany	35.1	—24	7.9	S
	Little Rock	51.6	—12	9.9	NW		Buffalo	34.7	—14	17.7	W
Cal.	San Francisco	54.3	29	. . .	N		New York	40.3	— 6	13.3	NW
	Los Angeles	58.6	28	. . .	NE	N. M.	Santa Fe	38.0	—13	7.3	NE
Colo.	Denver	39.3	—29	7.4	S	N. C.	Raleigh	49.7	— 2	7.3	SW
	Grand Junction	39.2	—16	5.6	SE		Wilmington	53.1	5	8.9	SW
Conn.	New Haven	38.0	—14	9.3	N	N. D.	Bismarck	24.5	—45	. . .	NW
D. C.	Washington	43.2	—15	7.3	NW		Devils Lake	18.9	—44	11.4	W
Fla.	Jacksonville	61.9	10	8.2	NE	Ohio	Cleveland	36.9	—17	14.5	SW
Ga.	Atlanta	51.4	— 8	11.8	NW		Columbus	39.9	—20	9.3	SW
	Savannah	58.4	8	8.3	NW	Okla.	Oklahoma City	48.0	—17	12.0	N
Idaho	Lewiston	42.5	—13	4.7	E	Ore.	Baker	34.1	—20	6.0	SE
	Pocatello	36.4	—20	9.3	SE		Portland	45.9	— 2	6.5	S
Ill.	Chicago	36.4	—23	17.0	SW	Pa.	Philadelphia	41.9	— 6	11.0	NW
	Springfield	39.9	—24	10.2	NW		Pittsburgh	40.8	—20	13.7	NW
Ind.	Indianapolis	40.2	—25	11.8	S	R. I.	Providence	37.6	— 9	14.6	NW
	Evansville	44.1	—15	8.4	S	S. C.	Charleston	56.9	7	11.0	N
Iowa	Dubuque	33.9	—32	6.1	NW		Columbia	53.7	— 2	8.0	NE
	Sious City	32.1	—35	12.2	NW	S. D.	Huron	28.1	—43	11.5	NW
Kan.	Concordia	38.9	—25	7.3	N		Rapid City	32.3	—34	7.5	W
	Dodge City	40.2	—26	10.4	NW	Tenn.	Knoxville	47.0	—16	6.5	SW
Ky.	Louisville	45.2	—20	9.3	SW		Memphis	50.9	— 9	9.6	NW
La.	New Orleans	61.5	7	9.6	N	Texas	El Paso	53.0	— 2	10.5	NW
	Shreveport	56.2	— 5	7.7	SE		Fort Worth	54.7	— 8	11.0	NW
Me.	Eastport	31.1	—23	13.8	W		San Antonio	60.7	4	8.2	N
	Portland	33.6	—17	10.1	NW	Utah	Modena	38.1	—24	8.9	W
Md.	Baltimore	43.6	— 7	7.2	NW		Salt Lake City	40.0	—20	4.9	SE
Mass.	Boston	37.6	—13	11.7	W	Vt.	Burlington	29.3	—27	12.9	S
Mich.	Alpena	29.1	—27	11.3	W	Va.	Norfolk	49.1	2	9.0	N
	Detroit	35.4	—24	13.1	SW		Lynchburg	45.2	— 7	5.2	NW
	Marquette	27.6	—27	11.4	NW		Richmond	47.4	— 3	7.4	S
Minn.	Duluth	25.1	—41	11.1	SW	Wash.	Seattle	45.3	3	9.1	SE
	Minneapolis	29.6	—33	11.5	NW		Spokane	37.5	—30	. . .	SW
Miss.	Vicksburg	56.0	— 1	7.6	SE	W.Va.	Elkins	38.8	—21	4.8	W
Mo.	St. Joseph	40.3	—24	9.1	NW		Parkersburg	41.9	—27	6.6	S
	St. Louis	43.3	—22	11.8	NW	Wis.	Green Bay	28.6	—36	12.8	SW
	Springfield	43.0	—29	11.3	SE		La Crosse	31.2	—43	5.6	NW
Mont.	Billings	34.7	—49	. . .	W		Milwaukee	33.0	—25	11.7	W
	Havre	27.7	—57	8.7	SW	Wyo.	Sheridan	31.0	—45	5.3	NW
Neb.	Lincoln	37.0	—29	10.9	N		Lander	28.9	—36	3.0	NE
	North Platte	34.6	—35	9.0	W						

Compiled from Weather Bureau records for the United States, as published in American Society Heating and Ventilating Engineers' Guide, 1934

TO COMPUTE RADIATION REQUIRED OR SAVED

Rule V. *To find maximum amount of heat required per hour to maintain a desired indoor temperature, multiply heat required per degree F. (Column* 3) *by maximum temperature difference in degrees F. (Column* 4). Enter in Column 7 of Chart II. *To find heat saved in B.t.u. by use of insulation, multiply the product thus found by per cent of heat transfer stopped by insulation selected (Column 7 x Column* 6). *To find equivalent direct radiation (steam) saved by the use of insulation, divide amount of heat saved in B.t.u. (Column* 8) *by* 240.

TO ESTIMATE FUEL CONSUMPTION OR FUEL SAVINGS

IN all computations hitherto made the maximum temperature difference in degrees F. has been employed, because heating plants must be designed to meet the most severe conditions prevailing in the locality. In computing fuel consumption, however, the entire heating season is involved; and the average prevailing outdoor temperature governs the amount of fuel required rather than the lowest temperature ever recorded.

Rule VI. *To find total heat required in B.t.u. per heating season, multiply heat required per hour per*

TABLE V — RECOMMENDED VALUES FOR COMPUTING OVERALL COEFFICIENTS OF TRANSMISSION

Material	Conductivity or Conductance	Resistivity or Resistance
MASONRY MATERIALS		
Brick, Common	5.00	.20
Face	9.20	.11
Cement Mortar	12.00	.08
Cinder Concrete	5.20	.19
Cinder Blocks— 8 inch	.62*	1.61
12 inch	.51*	1.96
Concrete Blocks— 8 inch	1.00*	1.00
12 inch	.80*	1.25
Concrete	12.00	.08
Gypsum Fibre Concrete	1.66	.60
Hollow Clay Tile— 4 inch	1.00*	1.00
6 inch	.64*	1.56
8 inch	.60*	1.67
10 inch	.58*	1.72
12 inch	.40*	2.50
16 inch	.31*	3.22
Hollow Gypsum Tile—4 inch	.46*	2.18
Stone	12.50	.08
Stucco	12.00	.08
Tile or Terrazzo	12.00	.08
WOODS		
Fir Sheathing (1 inch), Building Paper and Yellow Pine Lap Siding	.50*	2.00
1" Fir Sheathing and Building Paper	.82*	1.22
Yellow Pine Lap Siding	1.28*	.78
Yellow Pine or Fir	.80	1.25
Maple or Oak	1.15	.87
Shingles, Wood	1.28*	.78
COMPOSITION ROOFINGS		
Asbestos Shingles	6.00*	.17
Asphalt or Composition Roofing	6.50*	.15
Built-up, ⅜" thick	3.53*	.28
Slate Shingles (per inch)	10.37	.10
PLASTERING MATERIALS		
Plaster (Gypsum)	3.30	.31
½" (as used on insulating boards)	6.60*	.15
Plaster Board (⅜")	3.73*	.27
(½")	2.82*	.35
Wood Lath and Plaster	2.50*	.40
Metal Lath and Plaster (¾")	4.40*	.23

Material	Conductivity or Conductance	Resistivity or Resistance
INSULATING MATERIALS		
Rigid Fibre Boards— ½"	.66*	1.52
1"	.33	3.03
1½"	.22*	4.54
2"	.17*	5.88
Corkboards—1"	.30	3.30
1½"	.20*	5.00
2"	.15*	6.66
Flexible or Blanket Insulations— ½"	.54*	1.85
1"	.27	3.70
1½"	.18*	5.55
2"	.14*	7.14
Fill-type Insulations—Rock Wool type	.30	3.30
between 2" (nominal) furring 1⅝"	.18*	5.55
between 4" (nominal) studs 3⅝"	.08*	12.50
Aluminum Foil (Reflective Type) (See Air Spaces Faced with Bright Metal)		
SURFACE COEFFICIENTS AND NORMAL AIR SPACES		
Surfaces, normal, still air (indoor)	1.65*	.61
Surfaces, polished aluminum, still air	.85*	1.18
Surfaces, air moving 15 m.p.h. (outdoor)	6.00*	.17
Air spaces, normal materials both sides	1.10*	.91
AIR SPACES FACED WITH BRIGHT METALS (50° F. mean temperature)		
Air space, faced one side with foil:		
over ¾" wide (a)	.46*	2.17
.375" wide	.62*	1.61
Air space faced both sides with foil:		
over ¾" wide	.41*	2.44
.375" wide	.57*	1.75
Air space divided in two with single curtains (both sides of curtain bright):		
each space over ¾" wide	.23*	4.35
.375" wide	.31*	3.23
Air space with multiple curtains, metal bright both sides, foils equally spaced (over ¾") in standard construction:		
2 layers, forming 3 spaces	.15*	6.78
3 layers, forming 4 spaces	.11*	9.22
4 layers, forming 5 spaces	.09*	11.66

Table based on data from A. S. H. V. E. Guide, 1934, with additions. . . . * Indicates Conductance and values are for thickness or condition stated, not per inch. . . . (a) Bright face of metal may face either warm or cold side without significant change in value.

degree F. (Column 3) by average temperature difference (Column 5), by total number of hours in the heating season during which this average outside temperature prevails.

The number of hours in the heating season is usually taken as seven months of thirty days, or 5040 hours. This figure corresponds to the period during which the average temperature difference given in Table IV, Column 1 prevails. If the heating season is shorter, obtain the average temperature from the nearest weather bureau for the period of time when the heating plant is in operation, and use the actual number of hours involved instead of 5040 hours.

Rule VII. *To find fuel required to heat an uninsulated building throughout a normal season, divide total B.t.u. per heating season (Column 10) by calorific value of the fuel to be employed. This value should be obtained from the source of supply when possible, or may be assumed from Table VI. If the actual calorific value is known, it must be reduced by the operating efficiency of the plant to arrive at the actual calorific value delivered.*

Example 4. What is the quantity of fuel required to offset the loss of heat through 1000 sq. ft. of wall of the same construction used in Example 1 (Section I in the Time-Saver Table) where the coefficient of transmission U equals .26, the average

TABLE VI — CALORIFIC VALUES OF COMMON FUELS

Fuel	Quantity	Approximate Range of Calorific Values	Probable Combustion Efficiency	Value Used in Rule 8 Unless Actual Value Is Known
Coal	per short ton	24,000,000 to 29,000,000	55-65%	15,600,000 Btu.
Domestic Fuel Oil . . .	per gallon	136,000 to 155,000	60-80%	100,000 Btu.
Manufactured Gas . .	per 1,000 cubic ft.	450,000 to 650,000	70-82%	400,000 Btu.
Natural Gas	per 1,000 cubic ft.	1,000,000 to 1,200,000	70-82%	800,000 Btu.

outdoor temperature is 36.4°F. (Chicago), the heating season is 5040 hours, and coal is used as fuel.

From the foregoing rules the computation may be set up as follows:

.26 x 1000 (sq. ft.) x (70 — 36.4°F.) x 5040 ÷ 15,600,000 (calorific value delivered — coal) = 2.82 tons of coal.

Rule VIII. *To find fuel saved per season by use of selected methods of thermal insulation, multiply fuel required to heat the uninsulated building (from Column* 11 *of Chart II) by per cent of heat transfer stopped by improvements (Column* 6, *Chart* II). *This gives fuel saved by insulation, weatherstripping or multiple glazing and should be entered in Column* 12 *of the Economic Chart.*

Example 5. How much fuel will be saved over that required in Example 4 if the wall were insulated in the manner described for Example 3; where coefficient *U* for the uninsulated wall is .26 and for the insulated wall is .10, and all other conditions are as stated in Example 4.

The long method is to compute the fuel required for the wall in Example 3 as follows:

.10 x 1000 x (70 — 36.4) x 5040 ÷ 15,600,000 = 1.08 tons of coal.

The saving is therefore 2.82 — 1.08 = 1.74 tons per season per thousand square feet.

The short method is to take the difference in coefficients (.26 — .10 = .16) divide by the coefficient without insulation .26, and multiply by 100 to find the percent of heat transfer stopped (Rule 4).

$$\frac{.16}{.26} \times 100 = 61.5\%$$

Taking this percent of the fuel required without insulation gives the saving in fuel through the use of the insulation specified.

2.82 x .615 = 1.73 tons saving per season per thousand sq. ft.

The same computations may be separately repeated for multiple glazing and weatherstripping.

USE OF RATIONAL METHOD ECONOMIC CHART

THE first part of Chart II has now been completely developed ready to translate the results into dollars in the second part of the chart. The remaining procedure is explained in the column headed "Source of Data." Line A lists the potential savings due to the proposed insulation, weatherstripping or multiple glazing methods and the percentage which each type of saving bears to the total.

Line B lists the estimated cost of insulation, weatherstripping and double glazing less the value of materials eliminated by these improvements. The result is given in line D as the net cost of insulation, weatherstripping and multiple glazing. From this should be subtracted the estimated value of the radiation saved as shown in line E. Some approximate estimate should be made of the probable cost of a heating plant for the uninsulated building and another estimate taken of the cost of the heating plant if the proposed insulation methods were adopted. From the difference between these two figures a fairly safe unit cost per square foot of radiation may be used for prorating the savings due to each phase of the thermal insulation work.

The values thus found, subtracted from the net cost of insulation, will give in line F the actual increase or decrease in the total building investment due to the use of insulation. If any value in line E is greater than the corresponding value in line D that insulation work pays for itself and reduces the total building investment.

In line G should be entered the total fuel savings due to insulation, weatherstripping and glazing obtained by multiplying the values in Column 12 by the local cost of the fuel saved. Dividing the values in line G by the value in line F and multiplying by 100 will show the rate of return on the actual net investment as result of the various improvements.

It will become apparent at once that the return on the dollar spent for insulation will vary from the return on the money spent for weatherstripping and double glazing. The intangible values of greater comfort, health, soundproofness, fire safety, freedom from condensation, resale value, etc. should again be considered at this point, as in many cases they are of more importance to the owner than the savings measurable in dollars.

It may be that the owner will find it inexpedient to employ the amount or type of insulation tentatively selected. With the basic data here tabulated, however, the various methods can be restudied with a minimum of effort, until the owner is satisfied with the investment involved and the fuel saving accruing from the investment.

Facts About
Reynolds Metallation

Polished Aluminum (Reflective Type) Insulation Products

A Reference Advertisement of the
REYNOLDS METALS COMPANY

REYNOLDS METALLATION is composed of bright polished sheet aluminum foil, cemented to one or both sides of a tough kraft paper. It reflects 95% of all radiated heat that strikes the exposed metal face, and in addition it is water-proof, wind-proof, vermin-proof, odorless and non-absorptive. Being easily handled and installed, and of very low initial cost, Reynolds Metallation may be used as an effective insulation against summer heat or winter cold, and also as a highly efficient building paper.

Why Metallation has insulating value. . . . Heat rays travel through space like light rays, and like light, may be stopped by opaque materials and reflected by bright surfaces. Just as light travels through complete darkness and becomes visible only when it strikes matter, so heat travels through cold and becomes noticeable only when it encounters matter. Heat traveling in this manner is called radiated heat. Of course, heat also travels by conduction (when a cooled substance is in contact with a warm substance), and by convection, which is the transfer of heat by moving films of air.

When air is confined in a so-called dead-air space within building construction, radiation is largely responsible for the movement of heat across this dead air space. The ordinary building materials commonly used to form these dead air spaces readily absorb radiated heat and pass it on to the cooler side. But Reynolds Metallation, when installed with the bright metallic surface facing the dead air space, acts literally like a mirror to these invisible waves of radiated heat, and reflects 95% of them back toward the source from which they come.

This reflecting property is combined with another well-known physical property of bright metal surfaces; that is, low emissivity. This means that only 5% of the heat imparted to Metallation by contact with walls or other sources is passed on through the air and lost. Thus it does not matter on which side of a dead air space Reynolds Metallation is applied. So long as the metal faces the dead air space, it reduces the loss of artificial heat from within the building in the wintertime, and is equally effective in reducing the passage of outdoor heat into the building in hot weather.

With these principles in mind, the various practical combinations of Reynolds Metallation with air spaces as shown in the diagrams at the right, can be easily understood.

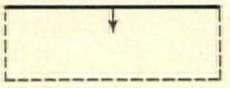
When Reynolds Metallation is used as a building paper (because of its impervious metal surface), its insulating value is secondary to a greater or less degree, when the bright side is in contact with such building materials as clapboards, sheathing, shingles, brick or stucco, in proportion as physical contact permits heat to be transferred by conduction. Thus the two uses

HOW METALLATION INSULATES

UNINSULATED

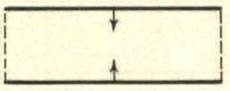
Air space 3/4" or more wide, formed by ordinary (non-reflective) materials:
Resistance .91

I
METAL ON ONE SIDE



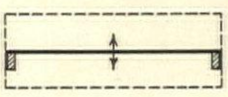
With one bright metal surface exposed facing an air space:
Resistance 2.17

II
METAL ON TWO SIDES



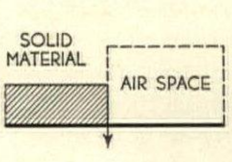
With two bright metal surfaces exposed, both facing same air space:
Resistance 2.44

III
AIR SPACE DIVIDED



With two metal surfaces exposed, in the middle of air space:
Resistance 4.35

IV
METAL FACING OPEN AIR (STILL)



Surface resistance of ordinary (non-reflective) building material in still air .61

When bright metal is exposed to still air, the surface resistance is 1.18

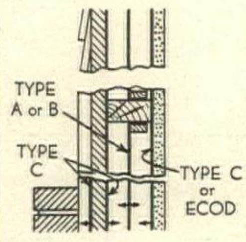
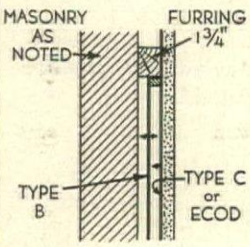
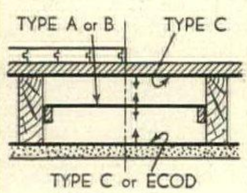
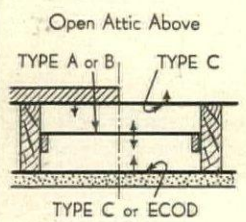
Arrows in diagrams indicate exposure of bright face of metal

The insulating values above given may be combined in various ways according to construction conditions to produce a wide range of insulating results.

Values used here are identical with those published in AMERICAN ARCHITECT Reference Data, (May Issue) "Thermal Insulation of Buildings."

PERCENT OF HEAT TRANSFER

Computed by standard methods using Resistances of air spaces faced with Reynolds

U = Overall Coefficient of Heat Transmission % = Percent of Heat Transfer Stopped	CONSTRUCTION	No Insulation	I TYPE C or ECOD METALLATION one side of air space		II TYPE C or ECOD METALLATION on both sides of air space		III TYPES A or B METALLATION forming two air spaces		IV TYPES A or B METALLATION forming two spaces with TYPE C facing still air (or I air space)	
		U	U	%	U	%	U	%	U	%
	Shingles or Clapboards and Sheathing	.26	.19	**27**	.18	**31**	.14	**46**	.13	**50**
	Drop Siding, no Sheathing	.37	.25	**32**	.24	**35**	.16	**57**	.16	**57**
	Stucco (I") over Sheathing	.31	.22	**29**	.21	**32**	.15	**52**	.14	**55**
	4" Brick Veneer, Sheathing	.28	.21	**25**	.20	**29**	.14	**50**	.11 (v)	**61**
	8" Solid Brick	.32	.23	**28**			.15	**53**		
	4" Brick on 8" Hollow Clay Tile	.23	.18	**22**			.13	**44**		
	I" Stucco on 12" Hollow Clay Tile	.22	.17	**23**			.13	**41**		
	12" Hollow Concr. Block	.32	.23	**28**			.15	**53**		
	Single Floor, Yellow Pine	.30	.22	**27**	.21	**30**	.15	**50**	.14	**53**
	Double Floor, Y. P. Sub Floor, Oak Top	.25	.19	**24**	.18	**26**	.13	**48**	.13	**48**
	Top Floor Ceiling, No Floor Above	.69	.28	**59**	.26	**62**	.24	**65**	.16	**77**
	Single Y. P. Floor Above	.30	.22	**27**	.21	**30**	.15	**50**	.14	**53**

NOTES: Small arrows in diagrams show exposures of bright foil faces.
These figures may be used in columns 2 and 6 of the Economic Chart published by American Architect to determine saving in fuel.
(v) Type C on sheathing facing I" air space behind veneer
(w) One air space; one bright side facing open air
(x) Forming one air space
(y) Type C under nailing strips, bright side toward shingles (one-third of area facing air space)
(z) Type C on under side of rafters facing open air

should be distinguished; primary insulating value requires the exposure of metal face to air space, while primary wind-proofing and water-proofing value may require the Metallation to be used in other ways.

Metallation is made in four forms. . . . Type C has polished sheet aluminum cemented to one side of heavy kraft paper, from edge to edge, for the most common application where the paper side is in contact with construction and the bright side faces an air space. Supplied in rolls 32″ wide, 93′ 9″ long, 250 sq. ft. per roll, weighing approximately 13 lbs. per roll.

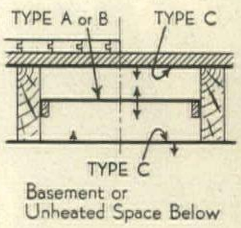
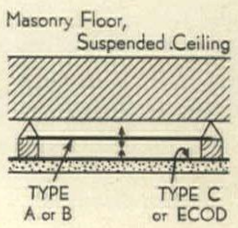
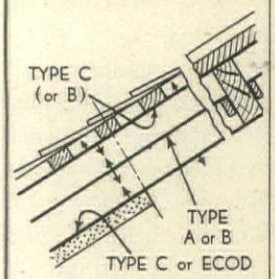
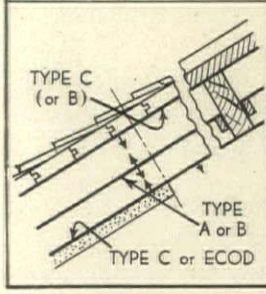
Type B has the sheet aluminum cemented to both sides of the paper from edge to edge, for application where it is desired to divide air spaces or where one side of the material is used for its insulating value and the other side, in contact with the construction, acts as a waterproof membrane. Supplied in rolls, 32″ wide, 93′ 9″ long, 250 sq. ft. per roll, weighing about 16 lbs.

Type A Metallation has polished sheet aluminum applied to both sides of the kraft paper with plain paper margins to facilitate application between framing members which are evenly spaced on 16″ centers. Width of alumium, 14½″; of paper 17″. Supplied in rolls 176′ 5″ long, 250 sq. ft. in roll, weighing about 18 lbs.

Metallated Ecod Fabric is a fabric-backed galvanized

STOPPED by REYNOLDS METALLATION

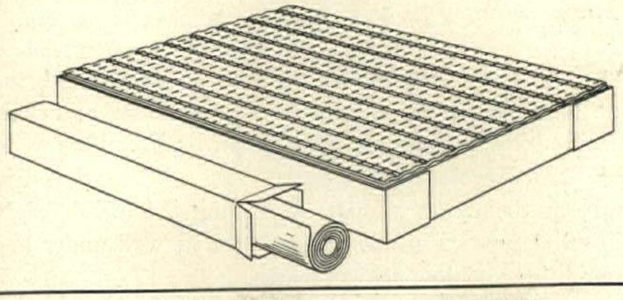
Metallation as shown in the table on the preceding page; all air spaces, 3/4 inch or more.

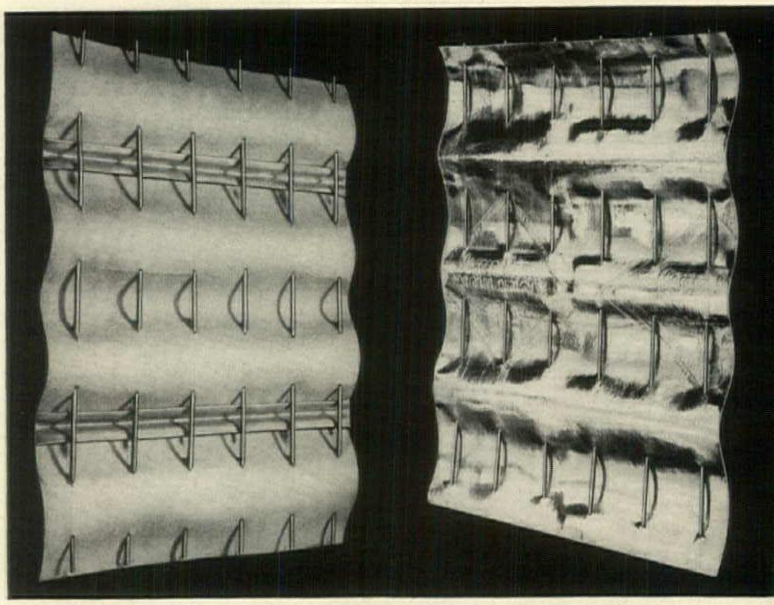
U= Overall Coefficient of Heat Transmission %= Percent of Heat Transfer Stopped	CONSTRUCTION	No Insulation	I TYPE C or ECOD METALLATION one side of air space		II TYPE C or ECOD METALLATION on both sides of air space		III TYPES A or B METALLATION forming two air spaces		IV TYPES A or B METALLATION forming two spaces with TYPE C facing still air (or I air space)	
		U	U	%	U	%	U	%	U	%
	Single Y. P. Floor, No Plaster Ceiling	.45	.23	49	.22	51	.18 (w)	60	.14	69
	Double Floor, Y. P. and Oak, No Plaster Ceiling	.34	.20	41	.19	44	.18	47	.13	62
	4" Reinf. Concrete	.37	.26	30			.16	57	.16	57
	6" Reinf. Concrete	.35	.24	31			.16	54	.15	57
	4" Concrete with 4" Hollow Tile Arches	.27	.20	26			.14	52	.14	52
	4" Concrete with 8" Hollow Tile Arches	.23	.20	13			.13	43	.12	48
	Wood Shingles on Nailing Strips, Plaster Ceiling	.30	.22	27	.21	30	.15	50	.14	53
	Same, No Pl. Ceiling	.46	.23 (x)	50	.20 (y)	57	.20 (w)	57	.14 (z)	70
	Composition or Asphalt Shingles on Nailing Strips, Plaster Ceiling	.37	.25	32	.24	35	.16	57	.16	57
	Same, No Pl. Ceiling	.64	.27 (x)	58	.22 (y)	66	.23 (w)	64	.15 (z)	77
	Wood Shingles Over Sheathing, Plaster Ceiling	.27	.20	26	.19	30	.14	48	.14	48
	Same, No Pl. Ceiling	.40	.21	48	.20	50	.19 (w)	53	.13 (z)	68
	Slate or Cement Shingles Plaster Ceiling	.34	.24	29	.22	35	.16	53	.15	56
	Same, No Pl. Ceiling	.56	.25	55	.24	57	.22 (w)	61	.15 (z)	73

metal reinforcing lath used as a plaster or stucco base. Polished sheet aluminum is asphalted to the back face of the heavy kraft paper fabric. This is formed in wide corrugations through which are woven galvanized wires spaced 1½" apart. These are welded at 4" intervals to galvanized V-shaped steel ribs set at right angles to the wires. Supplied in sheets 48¾" x 31", packed in cartons of 50 sq. yds.

Metallation is easily installed and low in cost. . . . Carpenters and roofers can quickly and easily install Types A, B and C Metallation. Lathers apply Metallated Ecod Fabric. No special instructions are required beyond

PROTECTED IN DELIVERY
METALLATED ECOD FABRIC, SHEETS, BOXED
METALLATION, ROLLS, BOXED





LEFT: Metallated Ecod Fabric, showing galvanized steel wire and V-shaped ribs with heavy kraft paper backing. The reverse side, center, is faced with polished aluminum foil for insulating value. **RIGHT:** Reynolds Metallation is easily installed as the foil is mounted on stout kraft paper

specifying the lapping of the sheets as normally done with building paper, or the spacing of Types A and B when applied between framing members to form double air spaces. The crimped edges are held against the studs, joists or rafters by wood stripping.

Water-proof, wind-proof, and vermin-proof. . . . Aluminum foil on Reynolds Metallation is impervious to wind and water, making Reynolds Metallation an ideal material for use as a building paper on walls and roofs and as a damp-proof and dust-proof floor lining paper.

Durability of Metallation. . . . The enduring qualities of high grade aluminum are well known. However, in order to obtain *permanent brightness,* which is essential to insulation, Metallation is made from selected aluminum of the highest degree of purity, and specially polished to insure maximum reflectivity. The sixty hour salt spray test prescribed by the United States Navy fails to tarnish it. Over several years similar tests of acid fumes such as are present in the air in smoky cities show it remains unharmed. Its performance under any special industrial conditions will be reported upon request. Correct installation and the glass-like polish of the material eliminates from practical consideration the collection of dust on the heat reflecting surfaces. No limit to the effective life of the material has yet been found.

Unaffected by Dampness. . . . The condensation that inevitably occurs in all insulated construction, usually within thick insulations, neither harms Metallation nor reduces its insulating efficiency. The condensation dries away as the weather changes, leaving the metal bright. No other type of insulation performs as well under high humidities and low temperatures.

How to Compute Insulation Value in Any Construction. . . . The first table in this reference advertisement showing diagrams of air spaces numbered I to IV gives the calculated resistances for Reynolds Metallation. The resistances shown should be added to the resistances of all other materials comprising the construction, including the proper surface resistances, after deducting the usual resistance for air space. The sum of these resistances divided into 1 is the over-all coefficient of transmission in B.t.u. per hour per degree F. The simplified method of computing insulation values given in American Architect Reference Data, "Thermal Insulation of Buildings," is recommended.

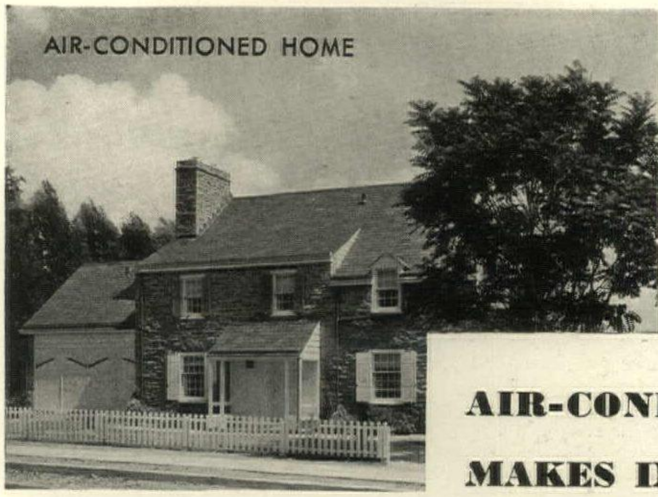
For convenience the Percent of Heat Transfer Stopped by Reynolds Metallation in appropriate types of construction is shown in the preceding table.

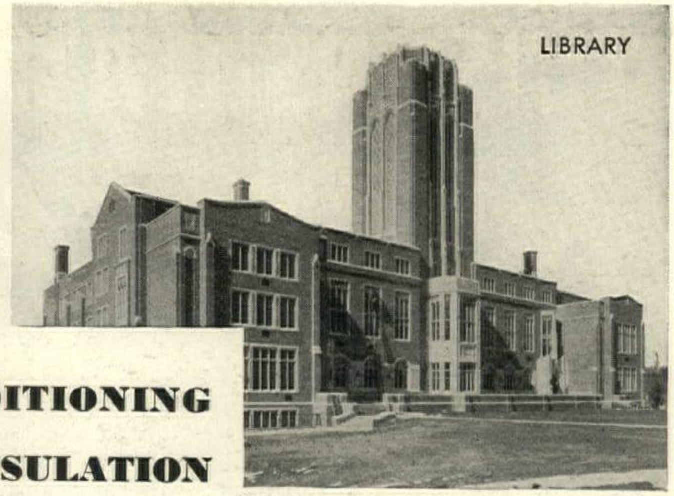
Where to Obtain Prices or Engineering Data. . . . Trained sales engineers, located in all leading cities, are ready to answer any question or solve any engineering problems concerning insulation you may have. Write, or wire our nearest office and a district representative will be at your service. Prices on Metallation may be obtained from local lumber and building material dealers. Metallation is stocked for quick delivery by leading dealers everywhere.

REYNOLDS METALS COMPANY
INCORPORATED

Manufacturers of Reynolds Metallation

19 Rector Street	**New York**
400 Wrigley Building	**Chicago**
345 South Ninth Street	**San Francisco**





AIR-CONDITIONING MAKES INSULATION MORE IMPORTANT THAN EVER BEFORE

UPPER LEFT—*Philadelphia's "Home of Controlled Climate," sponsored by the Philadelphia Gas Works Company, and heated and cooled by gas, is insulated with corkboard. Architect—Richard W. Mecaskey, Philadelphia.* LOWER LEFT—*Ladies' locker room at the Fox Chapel Golf Club, Pittsburgh. Ceilings in the clubhouse are insulated with corkboard. Architects—Brandon Smith & Harold O'Reif, Pittsburgh.*

UPPER RIGHT—*Concrete decks on all flat roof areas of the beautiful Mary Reed Memorial Library at Denver University are insulated with corkboard. Architect—Harry J. Manning, Denver.* LOWER RIGHT—*Concourse and other areas of the Cincinnati Terminal are insulated with corkboard. Brine lines are insulated with Armstrong's Cork Covering. Architects—Fellheimer & Wagner, New York City.*

For small areas or large, the problem of maximum comfort and minimum heating cost can be solved by insulating with Armstrong's Corkboard

IMPORTANT is the part insulation plays in assuring greater comfort—greater coolness in summer—for all types of buildings. Important, too, is its contribution to substantial fuel savings in the winter months.

With the increased use of air-conditioning, the need for insulating materials to retard the passage of heat becomes more vital than ever to building owners.

Architects for the Cincinnati Terminal . . . for Philadelphia's "Home of Controlled Climate," . . . for Denver's Mary Reed Memorial Library . . . for Pittsburgh's Fox Chapel Golf Club . . . knew how to get the kind of insulating efficiency they wanted. They specified Armstrong's Corkboard Insulation, thus insuring protection over a long period of years.

Armstrong's Corkboard can be depended on to guard roofs and walls against the passage of heat outdoors . . . to reduce the penetration of the sun's heat indoors.

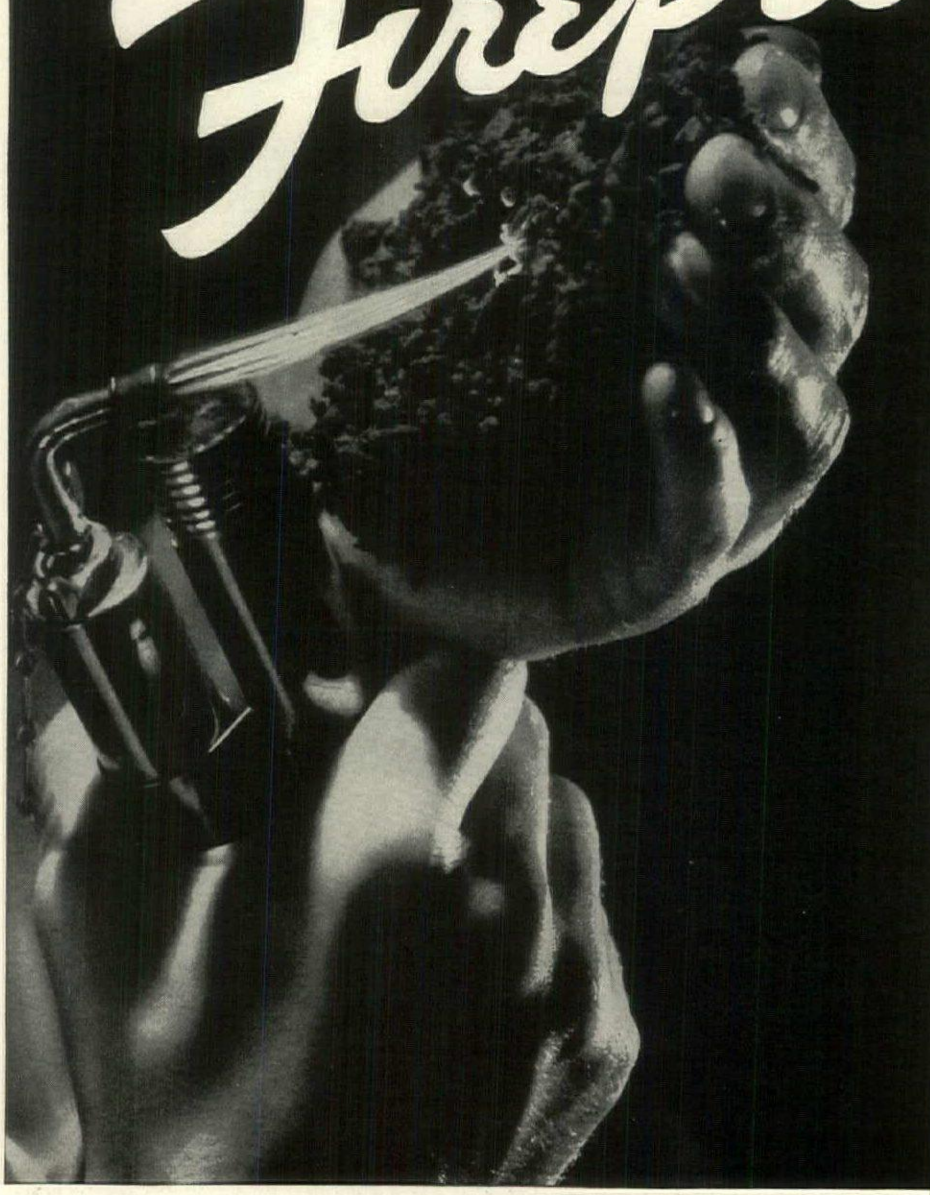
And for insulating cold storage rooms, Armstrong's Corkboard is equally effective. Structurally strong, corkboard is light in weight, easily handled. Its natural moisture-resistance insures efficiency through years of service.

There are many other important ways in which Armstrong's Corkboard and related building products offer practical solutions to architectural and engineering problems. You'll find descriptions of the various Armstrong products in the current issue of Sweet's. Further information may be secured promptly by writing to Armstrong Cork Co., 936 Concord St., Lancaster, Pa.

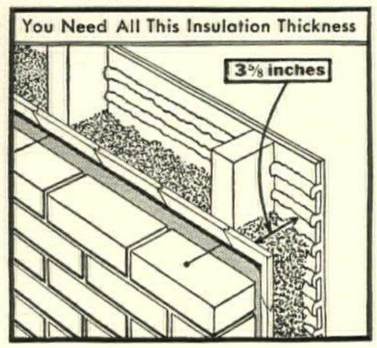
Armstrong's

CORKBOARD ~ CORK COVERING
INSULATING BRICK ~ TEMLOK INSULATION
VIBRACORK ~ ACOUSTICAL PRODUCTS

THIS INSULATION IS *Fireproof*



• Not just "fire-safe" or "fire-resistant," but completely and absolutely *fireproof*—Eagle Home Insulation will not burn or char. Furthermore, because it completely fills the spaces between framing members, Eagle Insulation cuts down the fire hazard for the entire property. Approved by Underwriters' Laboratories. May be installed with concealed knob and tube work without injury to the wiring. Eagle Insulation is not only fireproof and a non-conductor of electricity, it is also vermin-proof.



It is WALL-THICK . . . all insulation

Eagle Home Insulation is not a board, not a blanket. It has no structural pretenses. It is *all insulation*. It is applied in full wall thickness, preventing all the convection currents which carry heat even through walls which are partially insulated with thin boards or blankets. Eagle Insulation is lightweight. Clean. Does not settle. Rot-proof. Permanent.

EASY TO APPLY IN BOTH NEW AND OLD CONSTRUCTION

1. In Bat form

For new construction, Eagle Home Insulation comes in the form of Bats—insulating "pillows," 15 inches by 13 inches in size, 3⅝ inches thick. Quickly applied between wall studding, and between joists in the attic. Provides thick fireproof insulation. Greatly increases living comfort, and decreases fuel costs.

2. Applied pneumatically

For old construction, this is the convenient, easy, economical way to apply truly efficient insulation. The application is made by a skilled operator, whose machine blows the "wool" into the empty wall and ceiling spaces, without muss, in little time, and at very reasonable cost.

For complete data see catalog in Sweet's . . . For free sample send coupon

THE EAGLE-PICHER LEAD COMPANY, Dept. A.A. 5, Cincinnati, Ohio
Please send free sample of both forms of Eagle Home Insulation.

Name..............................

Address..............................

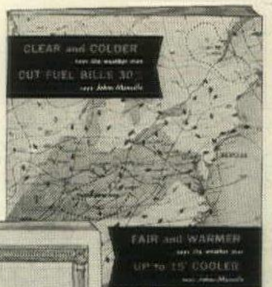
City.............................. *State*..............................

EAGLE HOME INSULATION

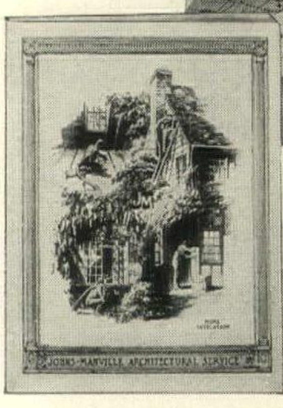
BRING YOUR
Insulation Problems
TO HEADQUARTERS


● Left: "Blowing" clapboard house with J-M Type A Rock Wool. Right: Fitting J-M Type B Rock Wool "bats." Either method fills wall spaces completely; leaves no room for circulation of air.

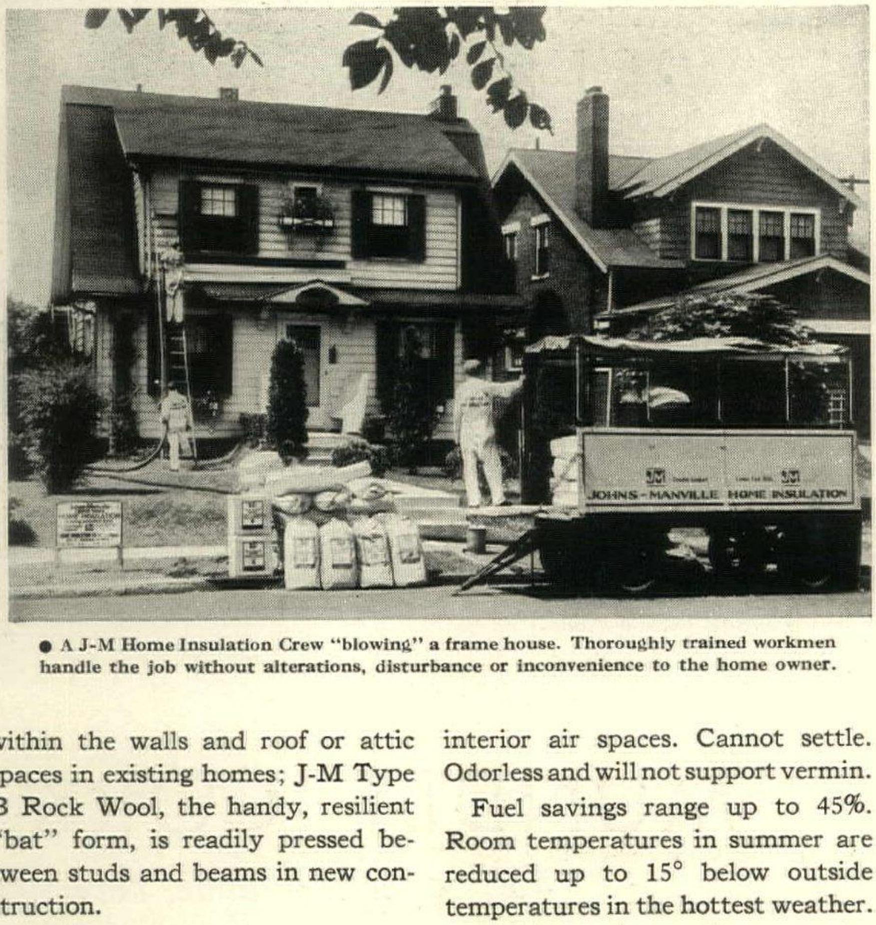
● The experience gained in the insulation of over 30,000 homes with J-M Rock Wool enables us to offer you a knowledge and service that answer every problem in the insulation of the new or existing home.



● Right: An interesting illustrated book that acquaints the property owner with the value of home insulation. The coupon brings a sample copy.



● Left: Home insulation treated from the architect's standpoint. Complete specifications. Data on heat transmission coefficients. Mail the coupon.



● A J-M Home Insulation Crew "blowing" a frame house. Thoroughly trained workmen handle the job without alterations, disturbance or inconvenience to the home owner.

WE invite you to bring your home insulation problems to us. Pioneers in the field, we can offer helpful coöperation. We developed the blowing machine which first made it possible to insulate existing buildings. And more recently, we introduced, for the first time, Rock Wool in "bat" form.

J-M Type A Rock Wool is "blown" within the walls and roof or attic spaces in existing homes; J-M Type B Rock Wool, the handy, resilient "bat" form, is readily pressed between studs and beams in new construction.

J-M Rock Wool, in either form, completely fills *all* spaces. It is noncombustible. Prevents the spread of fire by completely stopping wall-interior air spaces. Cannot settle. Odorless and will not support vermin.

Fuel savings range up to 45%. Room temperatures in summer are reduced up to 15° below outside temperatures in the hottest weather.

May we send you the two books illustrated at the left? Mail the coupon. Johns-Manville, 22 East 40th Street, New York City.

JM Johns-Manville
Home Insulation

JOHNS-MANVILLE, 22 East 40th Street, New York City
Mail me the Johns-Manville books on Home Insulation.

Name____________________

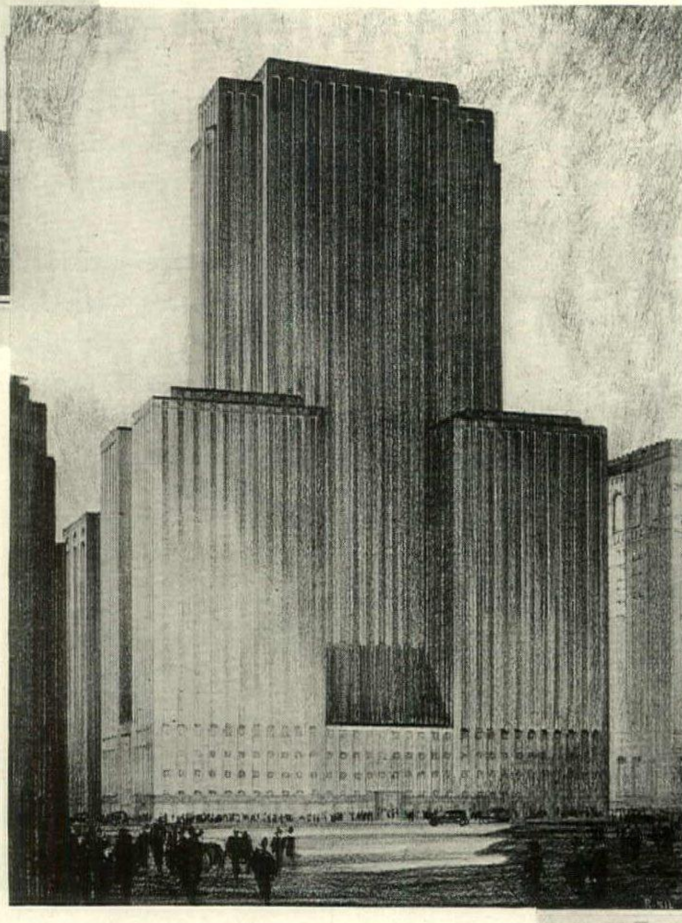
Address____________________

City________________State______

AA-5-34

MUNDET CORK HELPS

These Buildings to Perform



Whether or not you are convinced that a building is properly a machine, there can be no doubt about mechanical equipment . . . . .

Three typical buildings using Mundet Cork. Above is the New York Life Insurance Co. home office. In the center is the new Marshall Field building in Chicago. At the right, the Union Terminal at Cleveland, Ohio.

CORK INSULATION, whether installed as part of the building structure or as a unit of a carefully integrated mechanical program, pays dividends to the Owner and demonstrates the sound judgment of the Architect.

Mundet products include: Corkboard for cold storage purposes and roof insulation—Cork Pipe Covering for all low temperature lines—Bevelled Cork Lagging for tanks and coolers—Cork Floor Tile—Cork Bulletin Board—Cork Isolation against machine vibration.

A national organization is at your service, ready to furnish quick and competent specification and construction information.

MUNDET CORK CORP.

450 Seventh Avenue, New York, N. Y.

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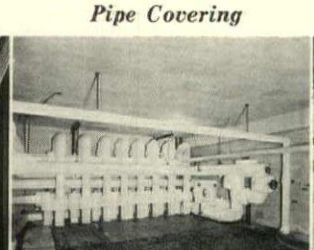
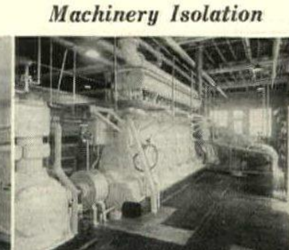
Ice Storage

Pipe Covering



Machinery Isolation

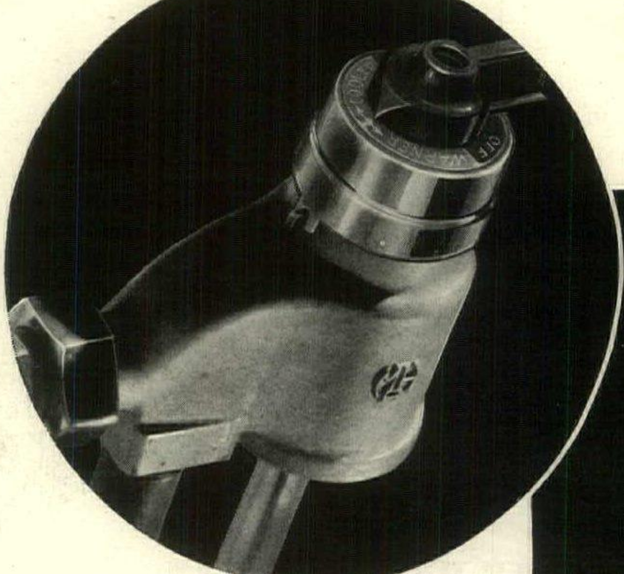


Refrigerator Interior

Capitalize on

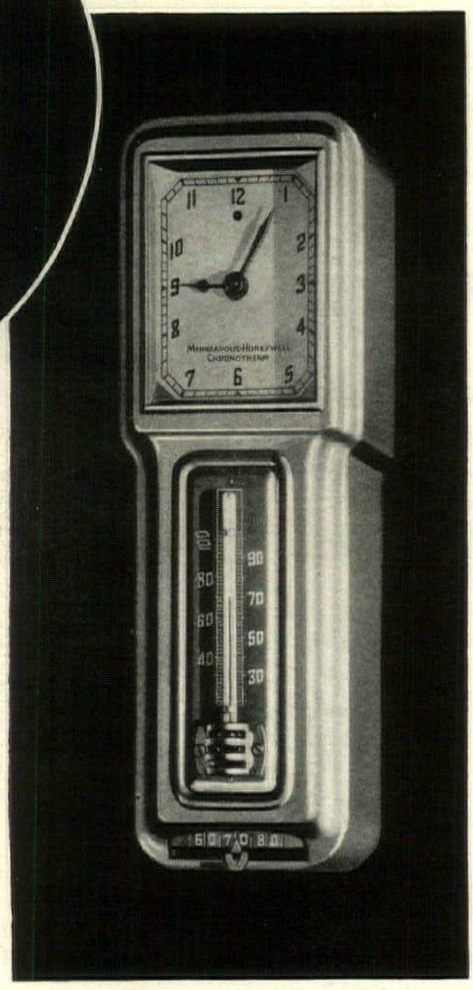
INSULATION WITH

PROPER CONTROLS



MODUSTAT

A self contained automatic radiator control valve which permits true modulation of direct radiation . . . a constant and even temperature to meet individual requirements.



THE IMPORTANCE of insulation cannot be too strongly emphasized. Yet without proper controls, which permit delivery of enough heat, and only just enough, to offset the loss, much of the effectiveness of insulation is wasted. . . Capitalize on insulation! Equip your buildings with a Minneapolis-Honeywell Control System. There is one for every type of building, old or new, large or small. . . . Minneapolis - Honeywell Regulator Co., 2738 Fourth Avenue South, Minneapolis, Minnesota. Branch or distributing offices in all principal cities . . . .

CHRONOTHERM

Provides unvarying temperature . . . and eliminates "Cold 70°" by combining the elements of time and temperature. Entirely electric and fully automatic.

MINNEAPOLIS-HONEYWELL

Control Systems

This startling transformation is an example of wise handling. Charles O. Curtis was the architect. The story is told in May Good Housekeeping

WISE indeed is the owner who realizes that good architecture is more often a matter of knowledge than money. In its articles every month on remodeling or new construction, Good Housekeeping Studio of Architecture & Furnishings never fails to make clear to Good Housekeeping's 2,000,000 readers the part the architect should play in making their dream homes come true.

Good Housekeeping

Everywoman's Magazine

ANNOUNCEMENTS

• The Consulting and Research Association—a new company formed by five research engineers formerly connected with the Westinghouse Research Laboratories—will provide a consulting, research and development service to manufacturing companies. The scope of the new organization's activity includes air conditioning, heating and ventilating, electrical installations, mechanical design and plan survey.

• A competition for three classes of bars has been announced by the Brunswick-Balke-Collender Co. of Chicago to be conducted under the rules of the American Institute of Architects. It is open to architects, draftsmen, artists and interior decorators with two years of experience or students who have had two or more years of college training. Winners of each class will be awarded a prize of $500. The lowest prize will be $25 and the total award of 117 prizes will amount to $5,000. Entry application for the competition must be made in writing to Angelo R. Clas, Professional Advisor, 333 North Michigan Avenue, Chicago, Ill., not later than June 1st.

• M. Georges Dengler, prominent French architect, has been appointed Professor of Architectural Design in the School of Fine Arts, University of Pennsylvania. Mr. Dengler, who will begin his teaching work in the fall of this year, has been a recipient of a number of important architectural awards including the Prix Redon and Grand Prize of Rome. He has had wide office experience.

• The departments of architecture and allied art of New York University are to change the quarters which they have occupied for the last four years at 230 East 43rd St., New York. The new location of the departments will be on the two top floors of 1071 Sixth Avenue near 41st St. The new quarters are better lighted than the old ones, and alterations designed by the Department of Architecture will include ateliers, exhibition rooms, class and lecture rooms, drafting rooms, a library and student lounges.

• A competition for the design of a post office lobby is announced by the architectural division of the Quarry Tile Industry. It is open to all architects not associated with the tile industry and carries a first prize of $200. Second and third prizes are $100 and $50 respectively. All drawings must be mailed not later than June 15, 1934. Full information may be obtained from Carl P. Dumbolton, Architectural Adviser Director, Quarry Tile Industry, 600 Investment Building, Washington, D. C.

• The Department of Architecture of the College of Fine Arts of New York University announces a competition for a graduate scholarship during the academic year of 1933-34. The scholarship carries an income equal to a year's tuition fee and leads to a degree of Master of Architecture. The competition is open to any graduate of an approved school of architecture between the ages of 22 and 30. Ap-

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The Architects' Manual of G-E Graded Wiring Systems, published in Sweet's 1934 Architectural Catalogue, offers architects the help of General Electric's forty years experience in designing and planning efficient wiring systems.

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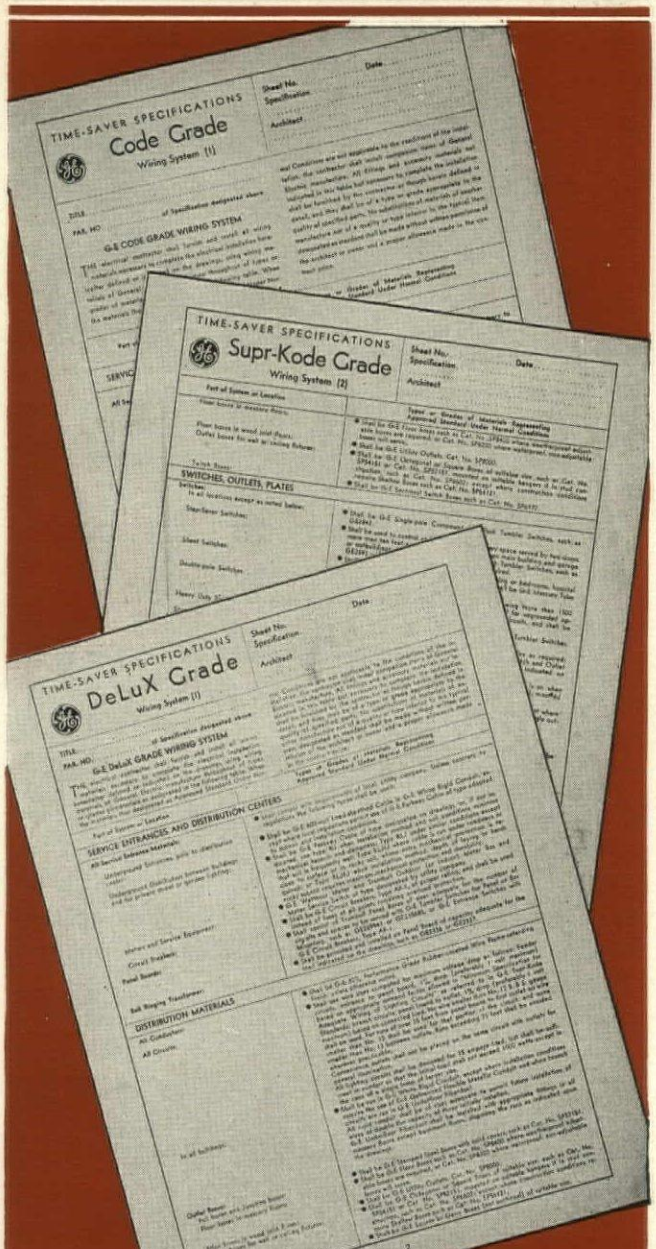


GENERAL ELECTRIC

WIRING MATERIALS

MERCHANDISE DEPARTMENT. GENERAL ELECTRIC COMPANY. BRIDGEPORT. CONNECTICUT plications should be submitted before June 9th to Dean E. R. Bossange, College of Fine Arts, New York University, 250 East 43rd St., New York.

PERSONALS

• If you change your address, please report the change direct to American Architect five weeks before the change is to take effect, sending both old and new addresses. The Post Office will not forward copies to your new address unless extra postage is provided by you. Our request is made to save you this expense and to assure the receipt of your American Architect promptly.

• Louis Ayres, member of the firm of York & Sawyer, and William Adams Delano, of the firm of Delano & Aldrich, were elected to associate membership in the National Academy of Design, at the opening of the Academy's 109th annual exhibition on March 13th. The two architects were among fourteen artists upon whom the honor was conferred.

• Robert Jahelka was elected President of the Architects League of Northern New Jersey at its early March meeting. He replaces Harry Lucht, who has been an energetic head of the organization during the past two years.

• Price & Walton announce the removal of their offices from 1220 Locust Street, Philadelphia, Pa. to Moylan Rose Valley, Pa.

• Frederick Mathesius, New York, an active member of the Architect's Code Committee, announces the removal of his office from 320 Fifth Avenue to 16 East 41st Street, New York City.

DEATHS

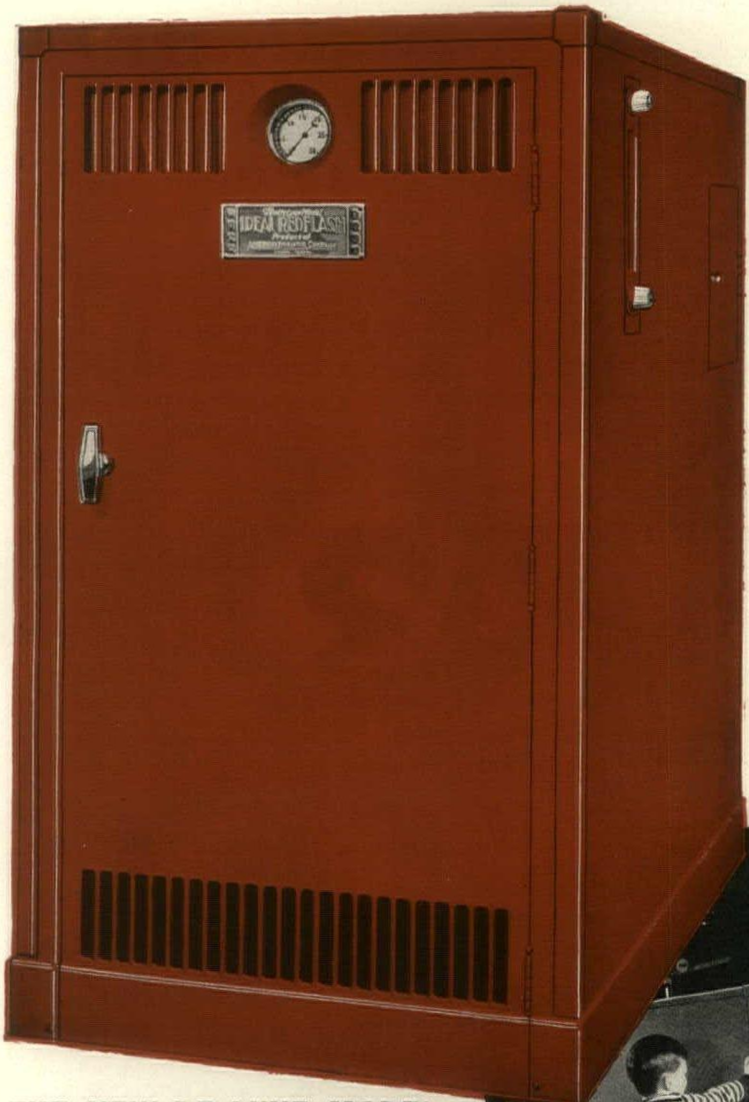
• Arthur G. Brown died on February 18th at the age of 65. He went to Chicago in 1889, and worked in the office of D. H. Burnham & Co. during the building of the World's Fair. He became a member of the American Institute of Architects in 1911.

• Jason F. Richardson, Jr., architect of Ottawa, Illinois, died during the middle of February. He was a member of the Illinois Society of Architects.

• John Corley Westervelt died in New York on April 8th. Mr. Westervelt who was 61 years old was born in Ithaca, New York and studied at Cornell University. For many years he was intimately associated with the design and building of the Childs chain of restaurants. Mr. Westervelt was a member of The American Institute of Architects and The Architectural League of New York.

• Walter Robb Wilder, New York architect, was found dead at his country home at Ladentown, N. Y., on April 5th. Mr. Wilder, who was 59 years old, was born in Topeka, Kansas, and studied at Cornell University. He was best known as the winner of a national competition for the state buildings at Olympia, Wash. At one time Mr. Wilder worked with the firm of McKim, Meade & White, later forming his own firm with Harry Keith White in New York. He was a member of the Architectural League of New York and the American Institute of Architects.

NOW YOU CAN SPECIFY STYLE AND BEAUTY AS WELL AS EFFICIENCY . . .



WHAT lovely fixtures do for the bathroom . . . what colorful equipment does for the kitchen . . . the new De Luxe Redflash Boiler does for the basement. Here at last is a boiler for solid fuel that is really handsome. You will welcome the opportunity it offers to design a distinctive game room, play room or den in the basement without the need for a separate boiler room. You will approve its modern design. And your client, because he knows the name and the dependability behind this handsome boiler, will approve your specification. Write today for all the details.

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ARCHITECTURE ALLIED ARTS BOOKS ENGINEERING BUSINESS ECONOMICS

IF YOU WANT TO GET AHEAD

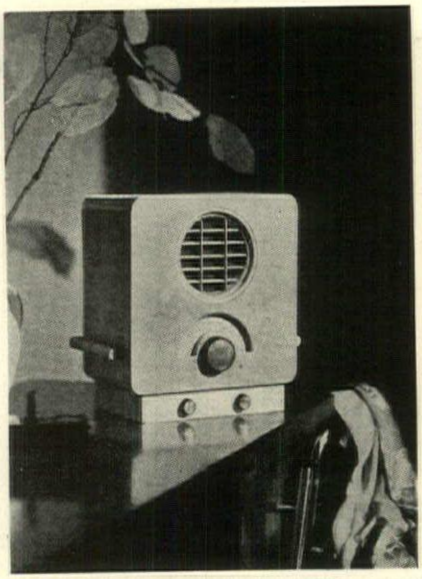
By Ray W. Sherman. Published by Little, Brown & Co., Boston, Mass. 186 pages; size 5 x 7⅝; price $1.50.

THIS little volume was not designed for architects, but many of them could gain much from it that would help in their many sided professional and business activities. Therein lies the worth of the book. It sets forth simple rules for more efficient business conduct that are applicable to every individual who wants to better his position in any walk of economic life. Almost every paragraph outlines—in easy-to-read, straightforward language—some homely, simple recipe tending toward success.

DECORATIVE ART, 1934

Edited by C. G. Holme. Published by The Studio Publications, Inc., 381 Fourth Avenue, New York City. Illustrated; indexed; 140 pages; size 8⅛ x 11½; price: paper, $3.50—cloth, $4.50.

THIS latest collection of modern ideas on home planning and decoration constitutes a kind of bird's eye view of design trends and progress of the past year. The editor of The Studio Year Book has chosen such a representative variety of significant subjects that architects will undoubtedly find the book a valuable chronicle of that type of design currently called "modern." Though of British origin, the book is international in content and shows a catholic choice of design examples. The list ranges from small houses to pottery and glassware, much of it being concerned with modern interiors, many of which are unusually attractive in the slick contemporary manner. Several of these interiors are presented in full color.



Radio cabinet designed by S. Chermayeff, F.R.I B.A. From Decorative Art, 1934

DYNAMICS OF EARTHQUAKE RESISTANT STRUCTURES

By Jacob J. Creskoff, B.S.-C.E. Published by McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York City. Indexed; 127 pages; size 6 x 9¼; price $2.50.

IN this brief monograph is presented what is probably the first coherent attempt to develop a practical system of aseismic design. Starting with an explanation of the cause and behavior of earthquakes, the author develops theoretical rules to overcome their effect on buildings. The latter part of the volume contains technical examples of aseismic design applied to various types of structures.

The Readers Have a Word to Say

• LOST—A MAGAZINE

Editor, AMERICAN ARCHITECT:

ANY chance of getting another copy of the last AMERICAN ARCHITECT? It certainly looks interesting. My copy just arrived and I took it along to read it at home. Stopped at a church to see about an alteration—and somebody walked off with my magazine. I cannot blame them, I should have known better in a church!—*Charles C. Colman, Secretary, Cornell Club of Cleveland, Cleveland, Ohio.*

• AN INSULT TO ARCHITECTS?

Editor, AMERICAN ARCHITECT:

IF your magazine is working for the good of the architectural profession, why do you permit such material as "A House that Forecasts the Home of Tomorrow?"

The statement made by a Mr. Victor G. Vaughan upon completing this "masterpiece" that architects would probably be replaced by "Housing Engineers" unless the architect could design modern electrical equipment, etc., is an insult to the architectural profession. We are tired of being told through the medium of the architectural press that we know nothing about the mechanical equipment of buildings. Who is responsible for the best results of planning for mechanical equipment in conjunction with an aesthetic setting, if not the architect? We need not draw heavily on our imagination to visualize the ugliness of the mechanized house designed by engineers with the architect as decorator. The result of this kind of planning is evident all around us and particularly so in this latest illustration of "A House that Forecasts the Home of Tomorrow."—*Walter Carlson, A. I. A., Wilmington, Delaware.*

• SPEED THE DAY

Editor, AMERICAN ARCHITECT:

WHEN the day comes that the practice of architecture is restricted in all states to qualified architects, and when all manner of competition is eliminated in one manner or another so that clients will go to the architect and architects, like doctors, will cease to spend their time and money in "go getter" methods (into which most architects were forced)—then, I am sure, architecture will begin to take on the flavor of a worth while profession. Architects will hold an enviable position in society; and position and training will be the means to a good income. —*C. Julian Oberwarth, Frankfort, Ky.*

From Royal Barry Wills, Boston, Massachusetts

• CONTRACTORS TO COMPLY WITH CODE

Editor, AMERICAN ARCHITECT:

I'D like to offer the following suggestion to other architects as a way in which they may cooperate with the President's New Deal program in general.

Either with a rubber stamp or in a special note near the title, all working drawings forming a contract set should be inscribed with a sentence somewhat as follows:

> "Contractor shall conform to all provisions of the NRA and Construction Code, as a part of this contract; all work shall be done as per the Construction Code hour and wage scale."

It is important that some such note appear upon blue-prints rather than as a part of specifications on contract forms; for in this way it may be seen by the workmen themselves. Naturally, the client should have his attention called to the paragraph as well.

I would like to see some such paragraph become a prerequisite to obtaining a permit through various local building departments. There is no reason why conformance with the Construction Code shouldn't be made mandatory by Building departments before the issuance of a permit, and that a note to this effect shouldn't appear on all drawings. Of course, this will strike different responses in different cities and townships—but that is something for local architects to work out for themselves if they like the idea.—*Gerald L. Kaufman, A. I. A., New York City.*

• PROS AND CONS OF SMALL HOUSE PRACTICE

Editor, AMERICAN ARCHITECT:

THERE is only one way, I think, for an architect to compete with the contractor and speculator in the small house field. That's to educate the public that the architect is an asset not a liability. I have met a lot of persons who did not know what an architect's business was, and I think it's about time they were educated.

My thought along this line would be a weekly radio broadcast that would be interesting to the general public, (not a lecture) and end with a slogan "when sick go to a doctor, when you build go to an architect." A program like this could be sponsored by the manufacturers of building material.—*H. Irving Braun, Architect, Long Branch, N. J.*

* * *

I AM unable to see how the architect competes with the small house contractor. He renders a service the latter cannot and doesn't attempt to do, but the public doesn't know this. It must be told. I have done small houses, but only because in every case the owner had been aware of the architect's functions and came to me convinced he was in the end saving himself money and trouble.

The Small House Bureau, I believe, has done the profession a lot of harm. The public has the idea it is just a matter of a set of ¼" scale plans. Until it is told differently our case is awkward.

Legislation should be passed requiring all work costing at least $1,000 to be done under the direction of an architect. I understand this is the case in France.

Summing up, it seems to me, above all else, we need publicity.—*G. Piers Brookfield, A. I. A., A. R. I. B. A., New York, N. Y.*

* * *

I RECOMMEND the following:

First—The profession should establish in the minds of the public, that anything pertaining to building should be handled by an architect, whether it be a $10,000,000 proposition or a $500 garage.

Second—In every important city, pressure should be brought about to pass legislation to prohibit—by refusing "permits"—the drawing of plans by anyone except a qualified or registered architect or engineer.

Third—In each city or given area

Architects, Engineers, Contractors and Material Companies should organize for the purpose of forcing each one in each division to furnish and do his legitimate part of the work or business. Thus eliminating Contractor from trying to be an Architect; Architect from being Contractor; and Material Companies from being Architectural and Contracting Bureaus.

Fourth—If any field of business, such as "Small House Field," requires mass production plans in order to acquire it, let us furnish same at mass production prices, even using "Small House Bureau Plans," but through qualified architects, where they could make enough profit to make a living and further have an opportunity to sell their supervision, etc., to the prospect. This can be accomplished, and would bring the majority of people who build homes in direct contact with some architect in his territory.—*Casimir J. Pellegrini, A. I. A., Pittsburgh, Pa.*

* * *

IT is entirely possible that the most promising field for the average architect lies in group housing on a small scale, to take the place of the usual "Contractor's sub-division." Practice in this field would call for more organization, and additional skill in major plan technique, but would probably fill the gap between the larger, highly individualized house, and the mass low-cost housing upon which so much effort is now being spent.—*Schwab & Palmgreen, Architects, Pittsburgh, Pa.*

THE whole problem seems to me to be one of education by means of publicity, particularly in the newspapers and women's magazines. Whether it be in the form of an organized effort or by individuals, I am sure that something very definite must be done to awaken the minds of the general public to the real value of a well-designed house and to make them realize that the architect is necessary to that accomplishment.—*Julius Gregory, Architect, New York.*

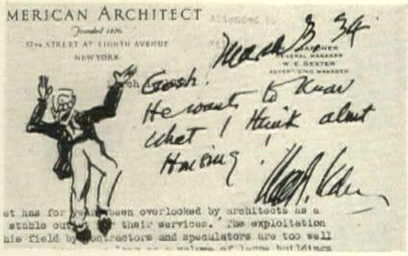
* * *

OUR office started at the beginning of the depression a series of small house plans and designs which we know through experience will be practically arranged as to light, ventilation, etc., for this particular section of the country. It is our intention to complete 75 or 100 plans of small homes, ranging from three to eight rooms. These will be standard plans, drawn to small scale, including plans, elevations and stock details, together with a blank specification which can be filled in to suit owner and contractor at the time figures are to be made.

It was our belief that a complete set of these plans could be sold at a nominal fee to the various lumber dealers throughout this section of the country. He, in turn, could offer these plans to prospective clients for inspection and study, with the understanding that if he should sell a bill of materials to the client, he would include a nominal amount to cover the cost of three or four sets of these plans and specifications, which would be ordered direct from us.—*Glen H. Thomas, Architect, Wichita, Kansas.*

* * *

LET us contact the leading banking, mortgage companies, building and loan groups, etc.; circularize these agencies and enlist their aid through their own bulletins and periodicals. Let us even go further by having the necessary legislation passed making architectural services a statutory requirement.—*Frank J. Ricker, Architect, West New York, N. J.*



From Robert D. Kohn, Washington, D. C.

• COMPLIMENT

Editor, American Architect:

PERMIT us to compliment you on the current (March) issue of your magazine as a very good number. Your editorial also is good as a statement of facts as to just where the profession stands with the Federal Government. Naturally we were interested in the comment on page 56, regarding ASHSB and Southern Pine Association! Good!—*Harry Lucht, Architect, Cliffside Park, N. J.*

• ABOUT THE ARCHITECTS SMALL HOUSE SERVICE BUREAU

Editor's Note: The following letters comment upon the editorial item headed "A Question of Policy" that appeared on page 56 of the March issue. Not all of them are reproduced here in toto. In the interests of brevity obvious duplication of comments has been eliminated.

Editor, American Architect:

THE idea of the Architects' Small House Service Bureau came from Minneapolis, brought about through the efforts of a number of its prominent architects; and the plan was laid before the convention of the A. I. A. at Nashville, I believe, in 1919.

The Northwestern Bureau, which was established soon after that time, as a single bureau and known as the Architects' Small House Service Bureau of Minnesota, engaged with the Southern Pine Association to produce some house designs and working drawings, which the Association agreed to publicize and to print in a book.

At the National Convention I was delegated by the Colorado Chapter to investigate the small house problem. Upon my return to Denver I reported favorably; and the Mountain Division of the Architects' Small House Service Bureau was established.

Our group is probably a similar organization to a dozen or more other small house service bureaus. It was financed entirely by the members of the Bureau, all of whom are architects; and over $10,000 in cash was contributed by architects to the Mountain Division Bureau. Our own firm contributed at least $3,000, without any thought of ever receiving any financial return. We have always worked in an altruistic spirit and our whole thought was concerned in rendering a service at a minimum price to the small home builder who could not afford the services of an architect. If you could visit Denver today and could compare it with a period of the early 1920's you would be amazed at the improvement in design and plan of the small home which was influenced entirely by the work of the group of architects who endeavored to render a service to the small home builder.—*W. E. Fisher, architect, Denver, Colorado.*

* * *

I HAVE read your editorial on page 56 of American Architect for March, 1934, in which you repeat and comment upon a statement appearing in an advertisement of the Southern Pine Association in the February, 1934 issue of the American Builder as follows: "The Architects' Small House Service Bureau . . . was made possible through the financial assistance of the Southern Pine Association."

I take exception to this statement and to your comment. I categorically deny that the Bureau was made possible through the financial assistance of the Southern Pine Association or that any other building material interest has had a hand in financing the Bureau at any time.

The facts about the Southern Pine Association contract, which, by the way, you might have secured from us for the asking, and which were also available to you at the Octagon, are as follows:

In 1920 the original corporation, The Architects' Small House Service Bureau of Minnesota, engaged with the Southern Pine Association for (a) production of house designs and working drawings, (b) publication of these in a book, (c) publicizing of the service in the press, and, (d) exploitation of the technical service of the Bureau, particularly in the Southern Pine Association trade territory.

The production of the designs and working drawings, specifications, quantity surveys, block plans and perspectives were paid for wholly by a small group of architects in the northwest. The cost was in excess of $40,000.

The publication of the catalog of designs was paid for by the Southern Pine Association. The Bureau wrote the text matter and assisted in the production of the book without compensation. The issue was sold by the Association, the Bureau acting with many others in the capacity of selling agent.

The Association indulged itself in some meager advertising of the Bureau service at its own expense.

The services of the Bureau were made available to dealers in the Association at 20% discount. Very few plans—less than 1000—were sold.

We do not deny that the Southern Pine Association gave valuable assistance to the Bureau in its first efforts to become known. The Southern Pine Association was the first large organization to recognize the Bureau, it did publish a catalog of our designs, and it did attempt to sell our technical services through its dealers.

No responsible person who was in possession of all the facts would call this a case of the Bureau being "largely financed by material interests."

But you imply other nameless subsidies, disregarding the manifest fact that the Bureau has been under the continuous direction of gentlemen who were members of the Institute and who also were at least as keenly alive as you to the consequences of selling the virtue of the Bureau. I submit that such innuendo does not give us credit for ordinary professional morality or for common sense.

We ask you to make public retraction of your statement, and to print this letter in a prominent position in the next issue of AMERICAN ARCHITECT.—*Robert T. Jones, Technical Director, The Architects' Small House Service Bureau, Inc., Minneapolis, Minn.*

* * *

I NOTE in your March issue an editorial which quotes the following from a Southern Pine Association advertisement:

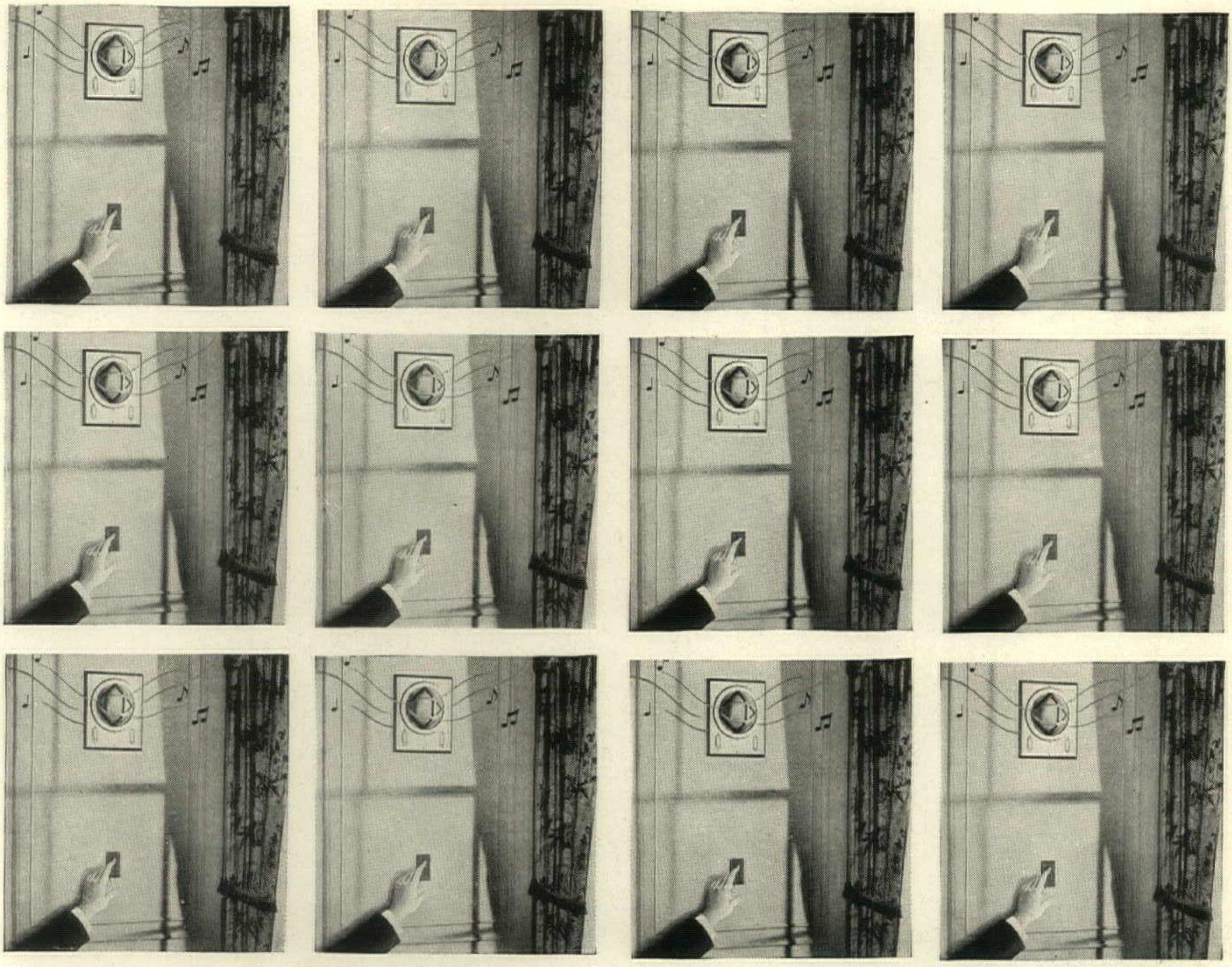
> "The Architects' Small House Service Bureau, Inc. . . . was made possible through the financial assistance of the Southern Pine Association."

Your editorial apparently assumes this statement to be true, suspects further subsidies from other material interests, and questions the Institute's endorsement of the Bureau on that account.

I happen, as a member of the original Bureau group, to have participated in the arrangements with the Southern Pine Association to which the statement in their advertisement evidently refers. I have been in close touch with all subsequent Bureau affairs. You will perhaps allow me to call your attention to certain facts as I know them.

The Southern Pine Association's statement is simply not true. Neither it nor any other material interests have ever contributed one cent of financial aid to the Bureau. Southern Pine did once act as sales agent for a group of designs produced by the original Bureau group. The Association was paid a percentage on the plans sold. The cost of producing the plans was borne entirely by members of the Bureau in the expectation (as yet unrealized) of remuneration from the profits on plan sales.

In the light of these facts, it is hard to see how the assumptions and suspicions of your editorial can be justified. I hope, therefore, that you will be good enough to give this statement the same publicity that you gave the editorial.—*Roy Childs Jones, University of Minnesota, Minneapolis, Minn.*



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Now you can really do something different in bathroom design! The New "Standard" Neo-Angle Bath offers you this opportunity because it is so distinctive, so smart . . . yet, so practical . . . that every home-owner will be enthusiastic about its convenience, its safety, its comfort and its roominess. It's almost square — with the tub set diagonally to provide seats in opposite corners. It combines every type of bathing in a single one-piece fixture.

Here is a fixture that will create a new enthusiasm for better bathrooms. It offers unlimited opportunities for unusual designs. See the "Standard" Neo-Angle Bath at the nearest "Standard" showroom. Write today for complete information and literature.

* Price includes bath in white regular enamel, complete with bath and shower fitting. Plus local delivery and installation by your registered master plumber. Pacific Coast Price $116.50. Time Payments Available.

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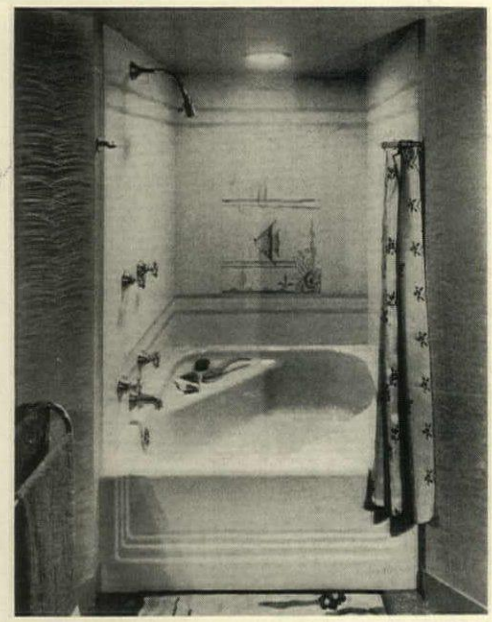
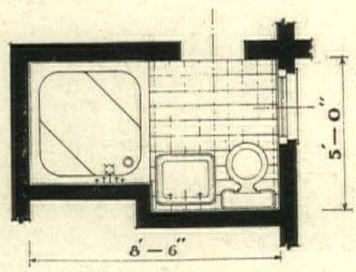
BRIEF REVIEWS OF MANUFACTURERS' ANNOUNCEMENTS
TO KEEP THE ARCHITECT INFORMED OF NEW PRODUCTS

New Materials and Equipment



Above, left, installation of Hotpoint Automatic Electric Range. Above, Mazda "Lumiline" tubular lamp. Left and below, Neo-Angle Bath and plan of typical bathroom of minimum size. Because of its small over-all size, the fixture can be used in many bathroom arrangements usually impossible with tubs of conventional design. The shape also permits convenience within small areas. The unit is said to be particularly well adapted to modernization installations. Prices are within the range of ordinary built-in baths



Hotpoint Electric Range

297M One of the new additions to the Hotpoint Automatic Electric Range line is a model that has been styled with the modern electric kitchen in mind. A few of the features of this new model include steel construction with white or cameo ivory porcelain enamel finish, Hi-Speed Calrod Units, large oven, automatic time and temperature control, warming compartments and utility drawers, and a black base. A product of the Edison General Electric Appliance Co., Inc., Chicago.

Mazda Tubular Lamps

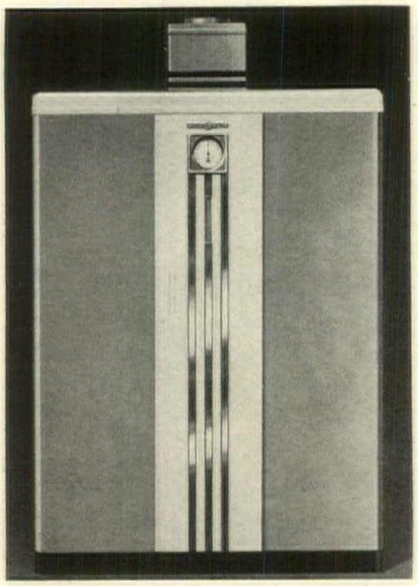
298M A new line of tubular lamps, designated as Mazda "Lumiline" Lamps, has recently been developed. Metal contacts on ends permit these lamps to be placed end to end, forming continuous line of light. The Lumiline lamp employs a single stretched-coil filament drawn out into a continuous line from one end contact cap to the other. A channel backbone inside the bulb carries the filament along the tube. Special sockets to hold each lamp in place are being developed. Announcements were received from General Electric Company, Cleveland, and Westinghouse Lamp Company, Bloomfield, New Jersey.

Neo-Angle Bathtub

299M An entirely new kind of bathtub, known as the Neo-Angle Bathtub, has been announced by Standard Sanitary Mfg. Company, Pittsburgh. This 4-foot tub has a diagonal bathing recess. The corners not occupied by the deep recess form integral seats for use when entering or leaving the tub, for bathing children, or as a shower seat. As a shower receptacle the new unit offers unusual roominess. The bathing recess is equivalent to a standard 5'6" tub and is 5" wider. It is available in white and ten colors.

Temperature Control

300M A line of electric temperature regulators, comprising automatic valves for steam, gas, oil, water or brine flow control, actuated by thermostats of various kinds, has recently been placed on the market by Wilbin Instrument Corporation, New York. A "heat motor" instead of one of rotary type, is employed to operate the valves. There are no rotating parts or gears that require lubrication.



G-E Gas Furnaces

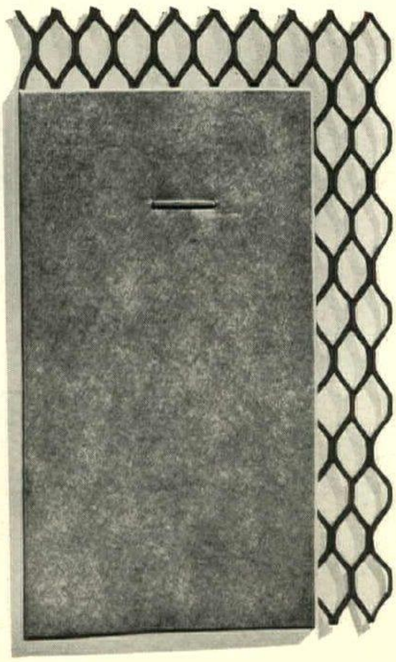
301M The General Electric Company, New York, has introduced a line of gas burning furnaces for steam or hot water supplementing its oil furnace introduced a year ago. The new gas furnace may be interchanged with GE oil furnace in a GE air conditioning system. The burner, boiler and all control elements are enclosed by a metal jacket.

Lathtex

302M A new plaster base has been developed by the Penn Metal Company, Parkersburg, West Virginia. This product, Lathtex, consists of metal lath with a kraft board backing. The backing is attached to the lath with a special metal clip, permitting a free flow of mortar on the back side of the lath. The metal lath is entirely embedded, giving the effect of back plastering.

Lock Brick Construction

303M A new type of brick veneer construction, employing but five materials—building paper, nails, waterproof cement, galvanized keystone channeled sheets and dovetail lock brick, has been announced by Tut-Hill, Inc., Pittsburgh. The brick are genuine kiln-burned brick, with a face the same dimension as standard but with a maximum thickness of 7/8 inches. The metal sheets are used to lock the brick in correct position.

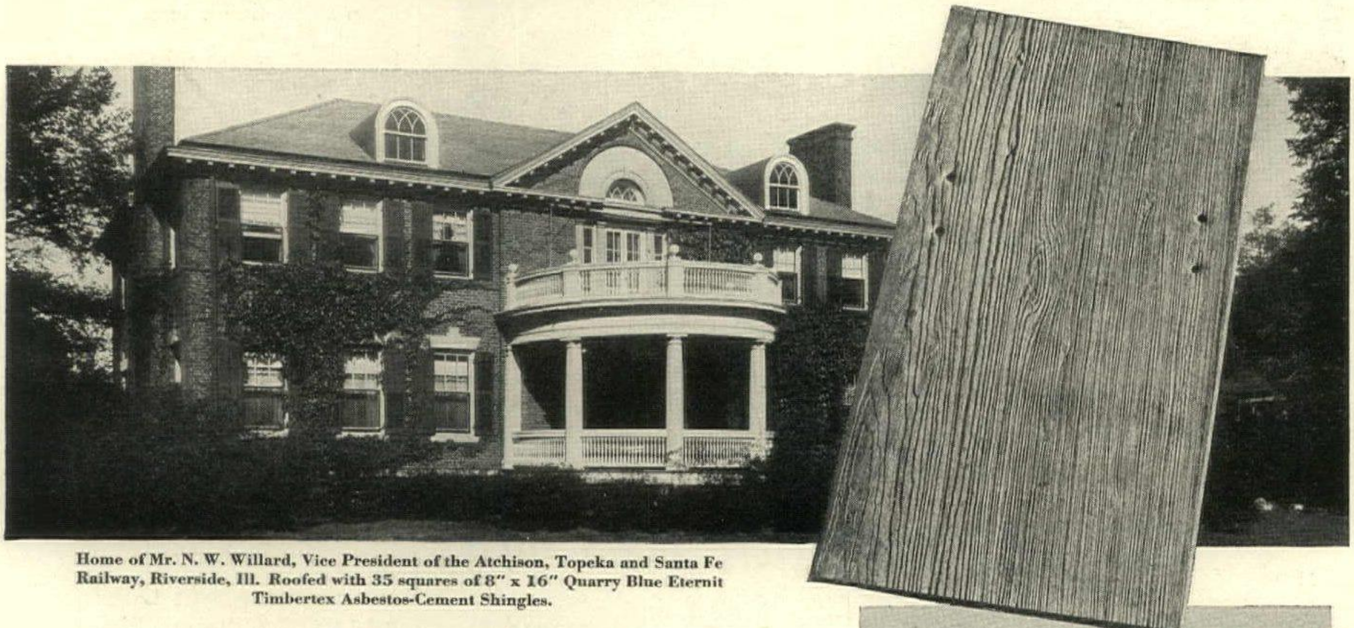


Chase Lighting Fixtures

304M Lighting fixtures of exceptional design quality and of authentic period character have been introduced by Chase Brass & Copper Company, Inc., New York. Designs range through all popular styles including the modern, and fixtures are finished in appropriate colors, or in brass or chromium plate.

ETERNIT TIMBERTEX

The Beauty of a Weathered Cypress Shingle Wrought in Fire-proof, Rot-proof Asbestos-Cement



Home of Mr. N. W. Willard, Vice President of the Atchison, Topeka and Santa Fe Railway, Riverside, Ill. Roofed with 35 squares of 8" x 16" Quarry Blue Eternit Timbertex Asbestos-Cement Shingles.

This RU-BER-OID Style Leader Has Every Appeal That Wins Roofing and Modernizing Business

HERE is a shingle everybody wants—Eternit Timbertex. Although built from time- and fire-defying Asbestos-Cement, it has all the natural beauty and charm of a Weathered Cypress Shingle.

The beauty of the rich wood colors and the deep shadow lines are still further enhanced by the staggering of the ¼" thick tapered butts.

Buyers marvel at the remarkably low cost of all this beauty wrought in fire-proof, rot-proof Asbestos-Cement. Appliers are enthusiastic about the time-saving application features of Eternit Timbertex. Nail holes are pre-punched for two exposures and every shingle is shaped for perfect application.

Check the unusual features of this Ruberoid leader that is making roofing and re-roofing history. The coupon will bring you samples. Clip and mail it today.

1. **TIME AND FIRE-DEFYING** — Ingredients: Portland Cement, reinforced with Asbestos Rock Fibres. Both are time and fire-defying.
2. **TAPERED CONSTRUCTION** — Designed to provide thickness and strength where they are most required. Shaped for perfect application.
3. **CYPRESS TEXTURED** — Entire shingle textured in various designs of weathered Cypress.
4. **WOOD COLORS** — Five rich, soft "wood colors" of lasting beauty. The mineral oxide colorings are an integral part of each shingle.
5. **STAGGERED BUTTS** — Double sets of punched nail holes permit laying irregular shingle courses.
6. **DEEP SHADOWS** — Butts approximately ¼" thick give interesting shadow lines.
7. **MODERATE COST** — Surprisingly reasonable first cost and no expense for upkeep.

The RUBEROID Co.

ROOFING MANUFACTURERS FOR OVER FORTY YEARS

ETERNIT MILLS, DIVISION OF THE RUBEROID CO.

Offices: BALTIMORE, MD., CHICAGO, ILL., ERIE, PA., MILLIS, MASS., MOBILE, ALA., NEW YORK, N. Y.

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NRA MEMBER U.S. WE DO OUR PART

THIS COUPON WILL BRING YOU SAMPLES

Asbestos-Cement Shingles ☐	Asphalt Shingles and Roofings ☐
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"Newtile" and "Newmarble" ☐	Safe-n-Dry Sheathing Paper ☐

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95 Madison Avenue, New York City, N. Y.

Please send full particulars about Eternit Timbertex Asbestos Shingles. Check at left for added information. A.A.-5-34

Name ____________________

Street Address ____________________

City ____________ *State* ____________

J-M Heavy Duty Asphalt Tile

305M Johns-Manville, New York, has created a new Heavy Duty Asphalt Tile Flooring for unusually severe service conditions. Resistance to indentation and abrasion, great strength, and ability to withstand exposure to moisture are claimed for this new product. It comes in four colors—black, red, mahogany and brown.

Dual Guth Super-Illuminator

306M The Edwin F. Guth Company, St. Louis, anounces the Dual Super-Illuminator, an indirect lighting fixture with three levels of illumination. By use of interchangeable color caps between reflectors, the exterior surface of the upper reflector may be moderately lighted in soft color. The unit can be equipped with double contact sockets providing three levels of illumination from one unit by the use of a Mazda three-light lamp. Electrolier canopy switches can be used to control the unit.

Window and Door Saddles

307M Accurate Weather Metal Strip Company, New York, offers a new type of saddle for outswinging French windows and doors. It is weatherproof and is adaptable to receive screen doors.

Porcelain Indicating Cutouts

308M A new line of porcelain plug and cartridge cutouts, which have built-in Neon lamp indicators, has been announced by the L. S. Brach Mfg. Corp., Newark. When a fuse blows, a Neon lamp glows to indicate the blown fuse; the light goes out when a new fuse is inserted.

Zinclad Nails

309M A non-rusting shingle nail which will stand severe exposure of roof work for periods upwards of 50 years, is a new product of the W. H. Maze Company, Peru, Ill. It has a duplex coating, the under being a zinc-iron alloy and the outer of pure zinc.

Alundum Safety Tread

310M The Norton Company, Worcester, Mass., announces that its Alundum Rubber Bonded Safety Tread is now available in three colors —red, green and buff—in addition to the black originally offered.

Warner Electric Dumbwaiter

311M The Warner Elevator Mfg. Company, Cincinnati, has developed a new electric dumbwaiter of the traction type, having a capacity of 350 lbs. and traveling at a speed of 50 ft. per minute. The equipment is self-contained in a steel hoistway, and can be used under counters or otherwise. Installation is said to be comparatively simple.

Sarco Steam Trap

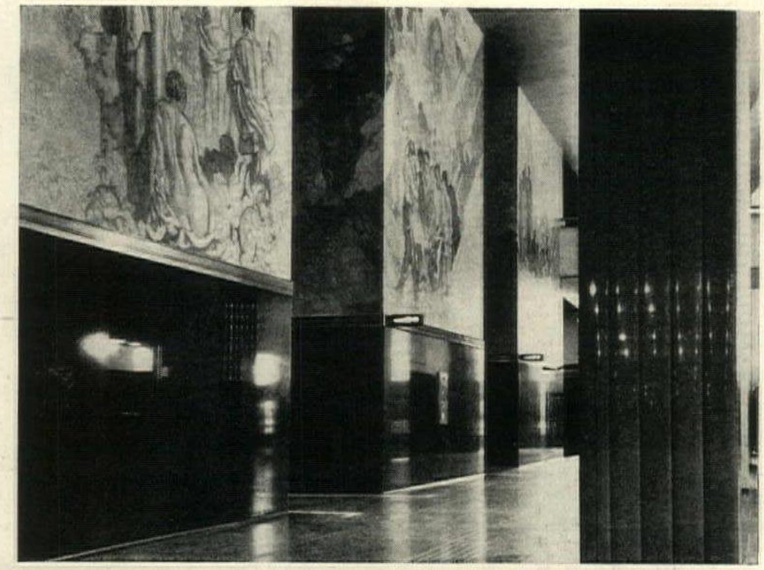
312M A lightweight, compact steam trap suitable for working pressures up to 180 lbs. per square inch is the latest addition to the line manufactured by Sarco Company, Inc., New York. All working parts are on the cover and can be exposed for cleaning by removing the trap body without disturbing connections. Inlet and outlet are on the same side, spaced apart for easy connection to horizontal pipes. The main discharge valve and seat are of stainless steel.

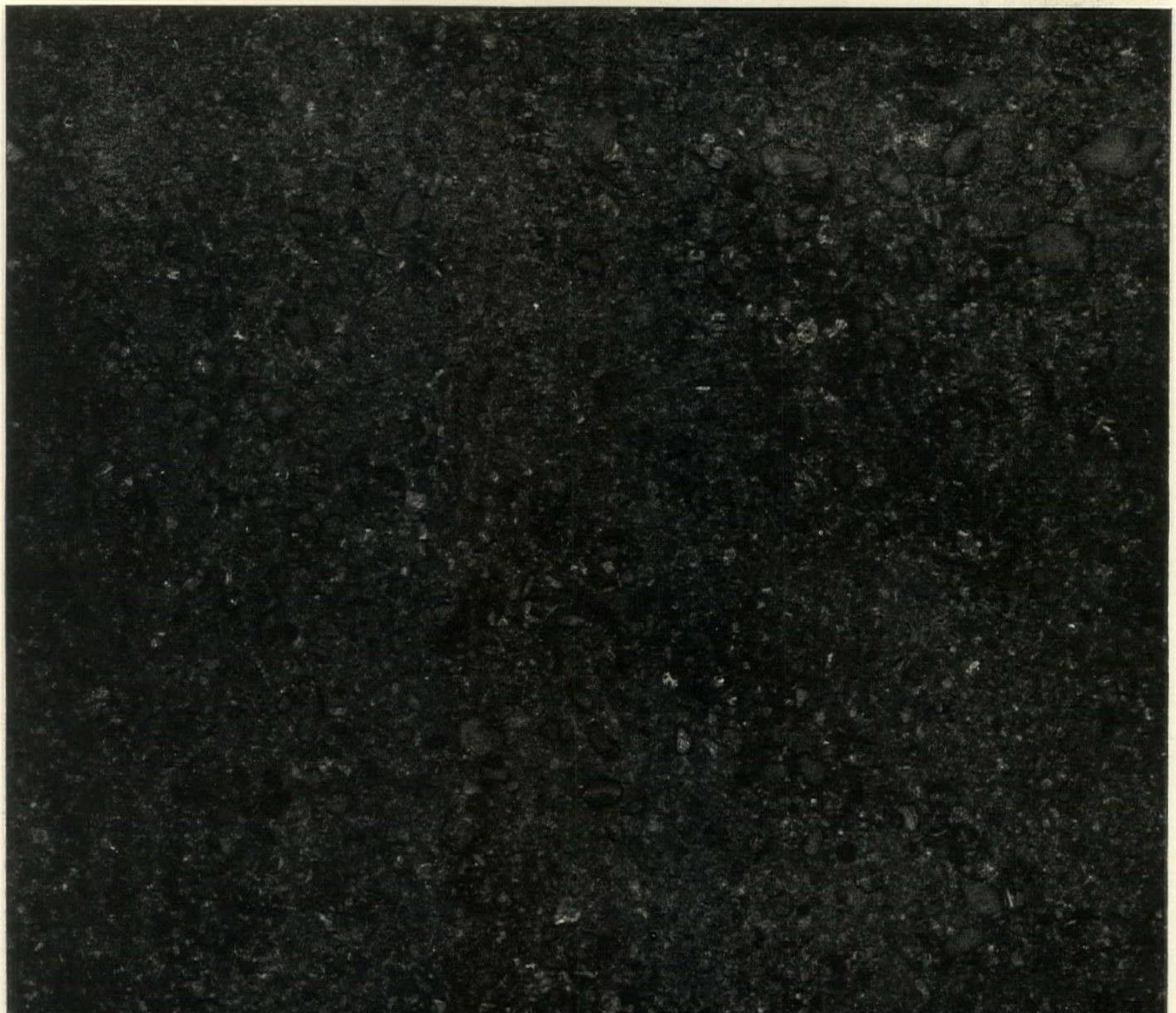
Toridheet Oil Burner

313M A new model pressure atomizing oil burner has recently been introduced by Cleveland Steel Products Company, Cleveland. The "whirlpool turbulence" method of providing air for combustion is a feature of this device, which has continuous electric spark ignition and burns Number Three oil.

FRENCH GRAY

FRENCH GRAY is quarried from the Vermont Marble quarries at Isle La Motte, in Grand Isle County, at the northwest tip of the state. It is a marble of minutely mottled design, almost black in mass, with a faint granular suspicion of red and blue. Especially adapted for interior use, French Gray finds decorative employment frequently as a corridor base. The small photograph shows its use in the elevator bays on the main floor of the new R. C. A. Building in Rockefeller Centre. The architects: Reinhard & Hofmeister; Corbett, Harrison and MacMurray; and Hood & Fouilhoux. Architects are invited to write for "Color Plates of Vermont Marble," illustrating, in full color, French Gray and twenty-two other varieties. Address: Vermont Marble Company, Proctor, Vermont.





VERMONT MARBLE

BEAUTIFUL • PRACTICAL • DURABLE

Six Architects in Search of Authenticity . . .

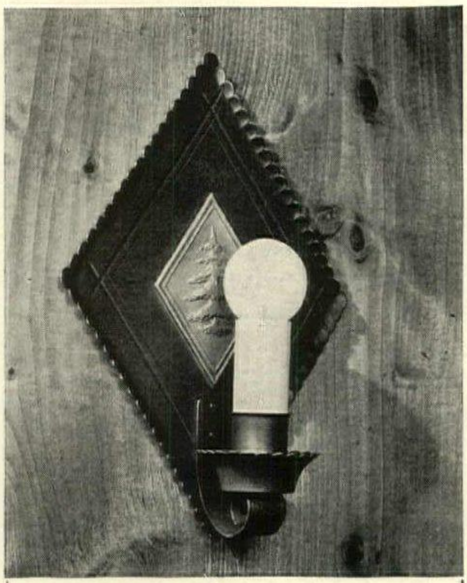
. . . write their specifications for the design and manufacture of Residential Lighting Fixtures . .

Architect No. 1

"In planning Early English homes I waste more time trying to find appropriate lighting fixtures than in the selection of any other item. I sometimes feel it is not worth the effort and I might better design all the fixtures and have them custom-made unless some manufacturer will produce *authentic* designs in good taste."

•

Chase agrees! . . . and presents for the approval of architects the Jacobean sconce shown below as typical of the many distinctive and authentic fixtures now being created by Chase in the Early English period.



Architect No. 2

"In the selection of lighting fixtures, I often view hundreds of designs to find one which suits my purpose. So many are dull copies of inferior precedent, or 'jazzed up' with anachronistic excrescences that I must automatically discard them. Why doesn't some manufacturer find a designer who would adapt the best of the old models and, catching their spirit, interpret it for modern use?"

•

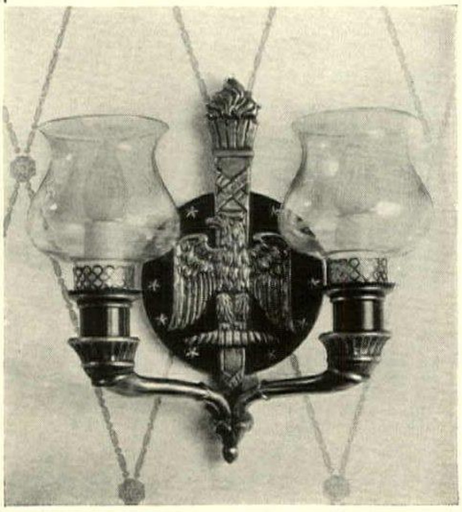
Chase has! . . . and offers as refreshing evidence the Pine Tree Shilling sconce shown above, inspired by the famous Massachusetts coin of 1652, one of the many truly authentic designs soon to be offered by Chase in its Early American group.

Architect No. 3

"To me, style selectivity is the important consideration in specifying lighting fixtures. In my work I strive for a freshness of design based on precedent, and I want to find the same characteristic in the lighting fixtures I choose. I am not content with mere archaeological reproductions either in my own design or in lighting fixtures, which are part of the architectural ensemble."

•

Chase will never be content with "mere reproductions". Convincing proof is the brilliantly designed bracket shown below, inspired by a McIntire eagle—characteristic of the imaginative but thoroughly authentic Federal fixtures created by Chase.



Architect No. 4

"I would like to see improvement in the basic materials and structural aspects of the lighting fixtures I must perforce choose for residences I design. All too many fixtures seem built down to a price; are flimsy, insecure. I don't expect the fixtures I choose to show rust spots after a year's use, nor to find socket-arms bending and breaking because of cheap basic construction. Lighting fixtures should be of permanent materials with permanent finishes."

•

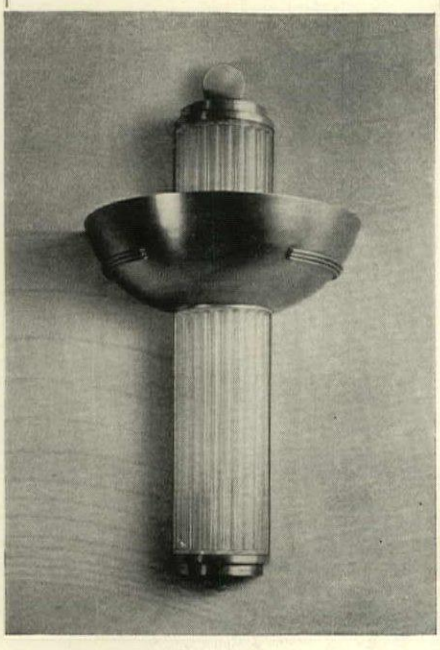
Chase Brass will be the basic material of all Chase Fixtures. Construction, finish and workmanship will be of like quality, as illustrated by one of the many authentically designed fixtures in the Georgian period, shown above.

Architect No. 5

"Modern interiors demand fixture design of an entirely different nature from the candle or gas era. It is high time we had fixtures designed for electric lighting as such. This does not mean that they need be bizarre. In fact, the best of the so-called 'modern' work is that which is closest to the ideals of the classic. The few attempts made to supply the architect with appropriate fixtures for modern interiors are far from adequate. They show little intelligent knowledge of the classic forms or decorative restraint so essential to authenticity in such fixtures."

•

Chase accepts the challenge! Its answer consists of over twenty Modern designs brilliantly conceived in chromium and frosted glass, exemplified by the distinctive bracket shown below.

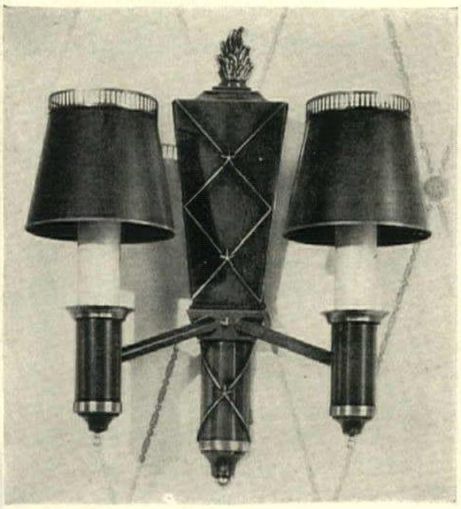


Architect No. 6

"I am not a lighting fixture designer, except by force of circumstances. In the Empire work I have done recently, I have not been able to use stock fixtures simply because those available show no more appreciation of the spirit, character and decorative significance of the period than does a ten-day Cook's Tour through France."

•

Chase heartily agrees! As to its own appreciation of Empire, concrete evidence is had in the true example shown below—characteristic of Chase authentically designed Empire Fixtures in traditional colors.



INVITATION

To all architects in search of authenticity in lighting fixtures Chase extends a cordial welcome to view a complete showing of Chase Lighting in Chase Tower, 10 East 40th Street, New York, during the latter part of May.

CHASE

CHASE BRASS & COPPER CO.

· INCORPORATED ·

Factories:
Waterbury, Conn.

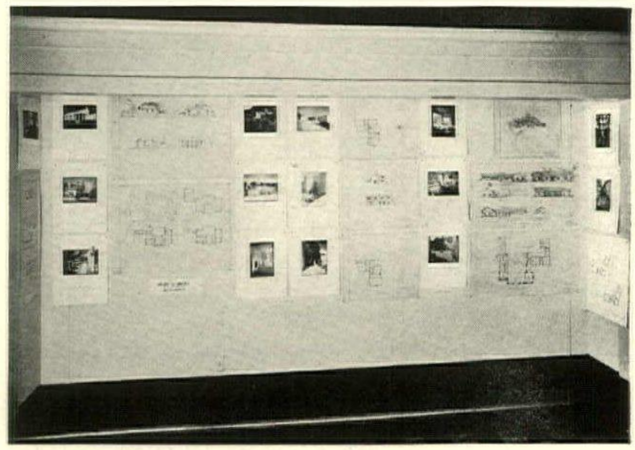
Chase Tower Showroom
10 East 40th St., New York

Trends and Topics of the Times

(*Continued from page* 71)

construction. H. J. Werder of New York City is the author of the suggestion. "Property," says Mr. Werder, "is not only exposed to risks such as fire, windstorm, earthquake, but also to risks or events which must happen inevitably, as aging, sickness and economic extinction. In theory at least, there is no reason why property should not adopt the same means man does for protection against inevitable happenings."

• Small suburban houses will be the subject of summer courses at the Columbia University Architectural School. One course will trace the history and design principles of domestic architecture. Specifications and building methods will occupy equally important places in the summer curriculum.



One-man architectural shows to center public attention on buildings are being held on the first floor of a prominently located office building in San Francisco. Each exhibit of the series, which is sponsored by the State Association of California Architects, will last two weeks. Above is an illustration of the first show. Right: Wilbur Henry Adams' unusual announcement was printed in black on heavy tan paper

• A pamphlet that architects interested in housing projects will find useful has recently been issued by the National Association of Housing Officials of Chicago, Illinois. Entitled "State Laws for Public Housing," it constitutes a memorandum on the drafting of enabling acts for public housing agencies. Although this pamphlet makes no attempt to solve the problems of low cost housing projects, it does set forth points of procedure for the promotion of housing laws in states where these are non-existent.

• At least one professional organization has had the courage to protest against the growing practice of state, county and city administrations taking over the functions of an architect on public works projects. The Providence Architectural Club has presented to the Governor and Mayors of Rhode Island a resolution requesting that public officers refrain from designing public buildings in direct competition with private citizens; that private architects be employed to develop such projects as are necessary; and that such changes be made in existing laws as may be necessary to accomplish this desired result. The action of the Providence Architectural Club may, or may not, prove futile. At least it is a gesture which could profitably be copied by every other architectural organization in the country. Only by concerted and determined effort can any unfortunate condition of this kind be changed.

• The following is quoted from the Magazine of the Common Brick Manufacturers' Association, "The small house field is becoming increasingly important. Upon it, right now, depends largely the revival of the construction industry. When the architect comes to realize its possibilities, there will be less building of houses haphazardly by jerry-builders, more of real architecture in this type of home, and no need for the objectionable stock house plan."

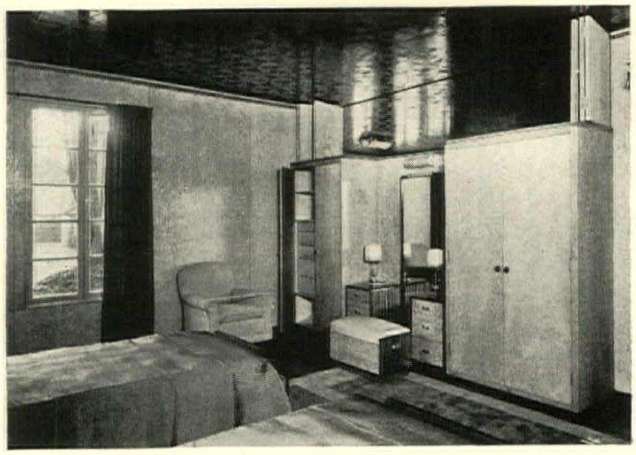
• Now under construction at "A Century of Progress" is the Ford Exposition Building. Albert Kahn, the architect, has eliminated the usual maze of steel work represented by built-up monitor roof trusses. In place of these, continuous 21 inch I-beams bent into monitor frames have been used, producing an interior unusually free from structural steel. The beams were welded with extra heavy beads erected over the central rotunda of the building which is 900 ft. long.

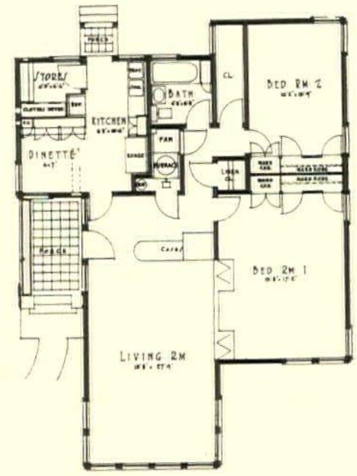
• A notation in the March issue regarding the St. Louis Post Office—for which Klipstein and Rathmann were the architects—erroneously gave the cost of the building as $500,000. We are glad to correct this statement. Mr. Rathmann writes that the cost estimate, which was prepared in March, 1933, showed a total of $4,275,000. The Post Office has a cubic content of 11,600,000 cubic ft.

• Plans for the Scottish Rite Temple at Birmingham, Alabama, were begun by the firm of Witcover, McCary & Drummond. After this firm was dissolved, the working drawings and specifications were completed by E. Lynn Drummond and Eugene D. Drummond under the firm name of H. W. Witcover.

• In the advertisement of The Ruberoid Co., published in the March issue, the architects of the building were incorrectly noted as being Akel & Cooper.

• This month's Frontispiece is of a portion of Dr. A. D. Mittendorf's house at Rye, New York, for which A. B. Weaver and Woolsey & Chapman were associated architects.





Bed room of a prefabricated house built by the Weyerhaeuser Timber Co. of Tacoma, Washington, that is expected to "revolutionize small house construction." It was built in twenty-one days from structural panels made entirely in the factory. Interior walls and partitions are of plywood in natural finishes. Ceilings are decorated. The house is completely air-conditioned

• One of the latest methods for putting radiant heat principles to practical use, has made its appearance in England, where the radiant heating panel was first developed. The material used might be called "resistance netting." It comes in rolls about a yard wide and about 1/25th of an inch thick. The netting is made of fine wire—a copper-nickel alloy. When applied in strips to walls or ceiling and connected with a house current, a temperature as high as 85 degrees can be obtained.

• Robert D. Kohn was recently awarded the Medal of Honor for 1933 of the New York Chapter of the American Institute of Architects. In his speech of acceptance Mr. Kohn said, "Despite the apparent failure and the frustration which all of us have had to put up with in recent months and years, it seems to me that the construction industry and consequently the architects, can look forward to a future different but greater than that of the past. We can make ourselves indispensable to any improvement in the standard of living that is bound to come."

• Full information regarding U. S. Civil Service examinations for five positions of Topographic draftsmen ($1,620 to $2,600 per year) may be obtained from the Secretary of the U. S. Civil Service Board of Examiners, Washington, or any post office.

• The Real Property Inventory, a CWA project involving 5,000 people in sixty-three cities, is practically completed. Information, now being tabulated by the Census Bureau, will, in time, be presented as a series of coordinated facts that touch on the economic and social conditions of 10 million people. The Inventory, by a house to house canvass, is developing a virgin field of building information which, it is hoped, will definitely answer the question as to whether or not there exists a surplus or a shortage of housing. From this standpoint it would be ideal if the searchlight of such an inventory could be turned on every city, town and hamlet in the country.

• House Beautiful and Home and Field announce their seventh Annual Small House Competition. As in former years, prizes are offered in three classes. The competition closes July 1, 1934. Full information may be obtained from House Competition Editor, House Beautiful—Home and Field Magazine, 572 Madison Avenue, New York.

• The Steel Constructor, published by the American Institute of Steel Construction, is the authority for the following item. "Houses built entirely of steel, each equipped with every modern convenience and capable of being erected by two men in sixteen hours, is the most recent industrial development in Tyneside, London, England. A large shipbuilding firm on the northeast coast has taken out a license to make the thermostatic steel house, invented by a Newcastle engineer. The house derives its name from its embodiment of the principle of the Thermos flask, having an inner and outer shell, the cavities being filled with a suitable nonconducting material which renders the dwelling warm in winter and cool in summer, as well as damp, fire and vermin proof."

• The Massachusetts Institute of Technology has announced that it will confer a degree of Bachelor of Architecture in City Planning. Courses leading to the degree include the study of such community problems as slum clearance, industrial housing, traffic systems and the beautification of urban areas. While based primarily on a knowledge of architecture, the course also embraces principles of such closely allied fields as engineering, sociology, economics and law.

• Dr. Werner Hegemann, authority on housing and city planning, defines city planning as "nothing but a review of our mistakes in city growth and our determination never to make them again."

• One result of haphazard planning, of haste making waste, or what have you, was forcefully demonstrated recently when C. W. A. workers, under the direction of Robert Moses, Commissioner of Parks in New York City, began busily to tear down the bathhouses, pavilions and breakwaters of one of New York's popular bathing beaches. The structures, described by Mr. Moses as being "engineering monstrosities" deserved, perhaps, to be thrown into the discard. But the curious thing about the whole procedure is that these buildings—the destruction of which served to feed, clothe and house 1934 C. W. A. workers—were only completed in 1933 as a city relief project at an estimated cost of $300,000!

Seventh Annual

SMALL HOUSE COMPETITION

CONDUCTED BY

HOUSE BEAUTIFUL—HOME & FIELD

The submission of material in this competition will be taken as acceptance of the conditions set forth below

CONDITIONS

1. This competition is open to all architects and architectural designers, and each competitor may submit as many houses as he desires.

2. A house may be eligible for only one class. The class in which it is entered must be written on the back of the mount.

3. It may be of any style and of any material, of one, two or three stories, and may contain, as noted, any desired number of rooms up to twelve. Breakfast rooms, pantries, baths, dressing rooms, halls, laundries and enclosed porches will not be counted as rooms. There must be presented:

a. Three photographs of the house:

1. General view
2. Exterior detail
3. Interior detail
   In Class III, one of the two details should show some significant feature of design or construction.

Two of these photographs are to be at least 8"x10" in size, and the third an enlargement at least 14" x 18", all to be in soft buff finish. The enlargement should be of the general view or exterior detail.

b. First and second floor plans, drawn in ink at any convenient scale, and pochéd, with rooms plainly labeled and dimensioned; plot plan showing location and orientation of house, also at any convenient scale.

c. Legend giving the following information:

1. Name of owner (not obligatory)
2. Location of house
3. Orientation
4. Composition of family
5. Special problems considered
6. Short description of interior shown, including furnishings
7. Approximate cost, either total or per cubic foot (not obligatory but very desirable)
8. Type of construction
9. Material and color of outside walls, roofs, trim, door and blinds
10. Name of product or manufacturer or both of following:
    - Walls
    - Roof
    - Floors
    - Interior woodwork
    - Windows
    - Insulation
    - Plumbing system (pipes and fixtures)
    - Heating system (boiler, hot water heater, air conditioning)
    - Miscellaneous equipment (refrigerator, ventilators, range, etc.)

The photographs, plans, and legend must all be mounted on one piece of beaver board, or a similar heavy mount, 30" x 40" in size, and of light buff or cream color.

d. Set of blueprints showing the four elevations of the house and, in Class III, details of construction. These should be folded and placed in an envelope which should be pasted to the back of the mount. These blueprints must not contain the name of the architect.

4. The contestant's name and address shall not be put on the front of the mount, but shall be written on the back of each mount, and a piece of paper, pasted around the edges, placed over it. On the back shall also be pasted an envelope, containing a plain card, 3" x 5" in size, clearly lettered with the name and address of the architect. Any house which the contestant does not wish to be exhibited should be plainly marked on the back of the mount, "Not For Exhibition." Otherwise we shall consider that we have his consent to exhibit his photographs.

5. On the lowest part of the mount shall be put, in one or two lines and nicely lettered, the inscription, "Submitted in the Contest Held by House Beautiful—Home & Field." In the upper right-hand corner shall be left space for a card 3" x 5" which will display the architect's name, if the mount is selected for exhibition.

6. All photographs and plans entered in this com-

petition and chosen either for publication or exhibition shall remain in our possession until after the exhibitions. We request that houses entered in this competition be not submitted to any other magazine until after they are released by us. All contestants will be notified of the awards soon after they are made, and those whose houses are not selected either for publication or exhibition may withdraw them by sending the necessary notification. Entries will be returned express collect. Contestants whose houses are exhibited will be notified when the exhibitions are over. If they desire, their photographs will then be returned to them upon the payment of the necessary transportation charges.

7. In order not to delay the exhibitions, and also to insure better reproductions, glossy prints of those photographs to be published in House Beautiful—Home & Field will be requested from the architects. (Additional photographs in readiness are desirable.) They will be asked also to furnish a second set of inked plans, or photographs of plans, for publication. It will be considered that the prizes and the honorarium of $50, which will be allowed for other than the prize houses that are published, will cover the expense of these prints and plans.

8. All entries should be carefully packed with stiff board for protection, and shipped *express prepaid* to the House Competition Editor, House Beautiful—Home & Field Magazine, 572 Madison Avenue, New York. The competition closes July 1, 1934.

This competition which has been conducted so successfully for the past six years by House Beautiful Magazine will be continued under the direction of House Beautiful combined with Home & Field. All architects, and especially those who have supported the competition so loyally in the past, are invited to enter.

Prize-winning and Honorable Mention houses will be published in the magazine beginning with the September, 1934, issue and an exhibition of photographs and plans of fifty houses will be featured prominently in the larger cities.

The competition calls for photographs and plans, as specified in the accompanying conditions, of houses built recently in the United States and not published in a national magazine (architectural magazines excepted). The houses will be judged and prizes awarded in three classes, as follows:

CLASS I

Best house of 8 rooms and under

First prize	$500
Second prize	300

CLASS II

Best house of 9-12 rooms

First prize	$500
Second prize	300

CLASS III

A special prize of $300 for the house, of any size, best exemplifying recent developments in construction, materials and architectural design without dependence upon period form. The judges will put special emphasis upon designs that are straightforward expressions of logical plans and upon construction methods that permit a saving in time and expense.

These will be judged by a jury of five, containing three members of the American Institute of Architects; Stewart Beach, editor of House Beautiful combined with Home & Field; and Ethel B. Power, who will conduct the competition. They will be judged on the following principal points:

1. **Excellence of design**
2. **Economy in space and convenience and plan**
3. **Adaptation to lot and orientation**
4. **Skill in use of materials**

Additional copies of this announcement may be had upon application to the address given above.

HOUSE BEAUTIFUL

COMBINED WITH

HOME & FIELD

572 MADISON AVENUE, NEW YORK CITY

INDEX TO ADVERTISERS

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Reminder

DRAWINGS

in the

PENCIL POINTS—FLAT GLASS INDUSTRY ARCHITECTURAL COMPETITION

for the design of a detached residence will be accepted up to

JUNE 4, 1934

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THIS competition is authorized by the Pencil Points Press, Inc., publishers of Pencil Points, and sponsored by the Plate Glass Manufacturers of America, the Window Glass Manufacturers Association and the Rough and Rolled Glass Manufacturers of America. It is conducted by Russell F. Whitehead, A.I.A. Professional Advisor. It is open to all in the profession, Institute members, under a ruling by the Institute Committee on Competitions, being free to enter. The closing date is June 4, 1934. As the purpose of the competition is to secure evidence of the imagination and skill of the competitors rather than to obtain elaborately prepared drawings, only one sheet of drawings is required. The high professional standing of the seven distinguished practitioners who have accepted the invitation to act as judges gives assurance that the relative rating of the contestants will have the concurrence of the profession at large, or, at least, that it will not be dissented from in any marked degree.

THE AWARDS

29 prizes, aggregating $3,100

First prize	$1,000.00
Second prize	500.00
Third prize	250.00
Fourth prize	100.00
25 Mentions, each	50.00

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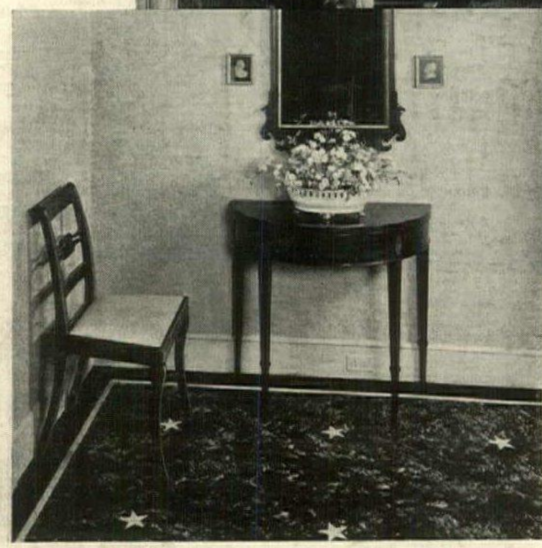
THE JURY

DAVID ADLER Chicago	LOUIS LA BEAUME St. Louis
W. POPE BARNEY Philadelphia	J. LOVELL LITTLE Boston
OTTO R. EGGERS New York	LOUIS STEVENS Pittsburgh

DAVID J. WITMER
Los Angeles

Reprints of the Competition program may be obtained from any of the leading architectural journals or from the sponsors

Sealex wood-grain designs, divided into panels by means of wood mouldings, create the effect of expensive wood paneling at a fraction of the cost.



Above: Cut-to-order star insets and a contrasting border give this black Veltone Floor its smart, "custom-tailored" look.

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Below: A one-piece cove base and border, installed at the point where walls meet floors, eliminates dirt-catching angles from this Sealex Floor—a Veltone pattern in cheerful greens.

For the *Next* small house
You Design

The unusual variety of patterns and colorings in Sealex Linoleum and Sealex Wall-Covering now enables you to achieve new and individual effects in modern small house design—at relatively moderate cost.

The photographs on this page are from a small four-room house in which Sealex materials were installed on floors and walls. On the floors are a variety of Veltone effects in Sealex Linoleum—something new and different in floor-covering. Sealex Veltones present a harmonious flow of color from wall to wall. Smart and individual-looking, they come in many rich color combinations.

On the living room walls, the realistic Sealex wood grain effect combines with the warm mellow browns of the Veltone Floor to give this room a distinctive, yet friendly, atmosphere. In the hall and kitchen, two light-toned Sealex Wall-Covering patterns contrast with the darker Veltone Floors.

Sealex Linoleum and Sealex Wall-Covering are washable, stain-proof. When installed by authorized contractors, materials and workmanship are backed by a Guaranty Bond. Write us for further information.

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FLOORS AND WALLS

CONGOLEUM-NAIRN INC., KEARNY, NEW JERSEY